AVIATION WEEK
A McGRAW-HILL PUBLICATION
JULY 12, 1948

AVIATION WEEK

Vol. 49 No. 2 — July 12, 1948

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McGRAW-HILL PUBLISHING CO., Inc., James H. McGraw (1860-1948), Founder. Publishing Office, 99-129 N. Broadway, Albany, N. Y. Return postage guaranteed. Editorial and executive offices, 330 W. 42nd St., New York 18, 330 S. Michigan Ave., Chicago 11, 68 Post St., San Francisco 4, Aldwych House, London W. C. 2, National Press Bldg., Washington 4, D. C. Architects Bldg., 17th & Sansome Sts., Philadelphia 3, Hanna Bldg., Cleveland 15, 2800 Prudential Bldg., Detroit 26, Continental Bldg., St. Louis 8, 1127 Sutter Bldg., Boston 16, Rhodes-Haverty Bldg., Atlanta 3, 621 South Hope St., Los Angeles 14, 723 Oliver Bldg., Pittsburgh 22. JAMES H. McGRAW, JR., President. CURTIS W. McGRAW, Vice-President and Treasurer. EUGENE DUFFIELD, Executive Assistant for Publications. NELSON BOND, Director of Advertising. JOSEPH A. GERARDI, Secretary. J. E. BLACKBURN, Jr., Director of Circulation. Aviation Week, 330 W. 42nd St., New York 18. Published weekly. Price 30¢ a copy, 50¢ in Canada. Allow at least ten days for change of address. Address all communications about subscriptions to Director of Circulation, 330 W. 42nd St., New York 18, N. Y. Subscription rates—United States and possessions $5 a year; $8 for 2 yr., $10 for 3 yr. Canada, $6 for 1 yr., $10 for 2 yr., $14 for 3 yr., payable in Canadian currency at par. Pan American countries, $10 for one yr., $16 for 2 yr., $20 for 3 yr. All other countries $20 for 1 yr., $30 for 2 yr., $40 for 3 yr. Please indicate position and company connection on all subscription orders. Entered as second class matter July 16, 1946, at Post Office, Albany, N. Y., under Act of March 3, 1879. Volume 19, Number 2. Printed in U.S.A. Cable address: McGraw Hill, New York. Member A.B.C. Copyright 1948, McGraw-Hill Publishing Co. Aviation Week is indexed in "Reader's Guide to Periodical Literature" and in "Industrial Arts Index." Following publications are combined with AVIATION WEEK: AVIATION, AVIATION NEWS, AIR TRANSPORT, AERONAUTICAL ENGINEERING and AIRCRAFT JOURNAL. All rights to these names are reserved by McGraw-Hill Publishing Co.

NEWS SIDELIGHTS

Spootz Blast

Opening gun of Gen Carl A (Tooey) Spaatz' public campaign against the throttling of air power by the National Defense Establishment was fired in last week's Life Magazine. Ghost written by Life writer Charles J. V. Murphy, the Spaatz blast charged that "Even now with the lessons of the last war notwithstanding the older services tend to look on him [the airman] as a bit of a mountebank peddling the gold brick of easy victory through air power." With his retirement at full pay and four star rank clinched by a special Congressional bill, Spaatz is expected to continue in an extremely vocal role that may embroil him in a battle as bitter as the Billy Mitchell case. Spaatz is convinced that nothing less than national survival is at stake in the postwar battle over air power.

Watch for Landis

Watch for former CAB Chairman James M. Landis to move back into the air transport limelight. Now a director of Colonial Airlines, he may figure in plans for merging East Coast carriers, although the simmering National-Delta deal reportedly is not to his liking. Through control of a substantial block of National's stock, Landis could play an important role in that hard-pressed company's future. Meanwhile, Dave Behncke's Air Line Pilots Association looms as a shadowy third party to any merger or sale involving National. ALPA will put up a last ditch fight against any proposal which does not guarantee re-employment of its striking members.

New Industry Report

Air Coordinating Committee report on manufacturing is being revised to fit the 70-Group Air Force Program. The Stanford University group that prepared an earlier classified report on industry capacity and requirements is assisting ACC in revising its report. Completed report is due around the end of July.

Reversible Prop Role

Discussions between CAA and industry representatives will begin soon in Hollywood on the use of reversible pitch propellers in calculations of the required minimum landing distances for transport type planes. Among the points to be determined are whether the reversible props will be allowed as a substitute for duplicate wheel brakes, as a factor in computing accelerate and stop distances, when reverse pitch should be applied on landing, and with how much power. If the reversible props are given full allowances, it will aid several transport type planes in meeting transport category regulations more easily.

Safety Proposals

CAB Safety Bureau is considering new regulations covering special handling of explosives, radioactive materials and other potentially dangerous air cargo. New requirements for stronger safety belts on passenger seats are also in the mill. Proposals are not yet ready for industry circulation.

Air Force Politics

One of the biggest surprises of the recently adjourned session of Congress was the political strength of the newly hatched Air Force in its battles with the Navy and Defense Secretary Forrestal. The once politically potent Navy found rough going in the air-minded 80th Congress.

Since strongest air power advocates were Republicans, the Air Force can continue to expect smooth sailing on the Hill despite a possible change in administration next January. Republican leaders regard the Secretary of Commerce as one of the key posts in their proposed "housecleaning" of Washington and this choice will have considerable influence on civil aviation.

It is not impossible that Air Force Secretary Stuart Symington may stay on in his post. Symington opposed the Truman Administration on the 70-Group program, got strong Republican support on the Hill, and has excellent personal Republican connections.

Budget Troubles

Military budgeteers are worried about the fiscal 1950 budget. They say the 48-49 budget ($14.4 billion) sets a level to take care of present size of the forces and a gradual increase in number of men up to next June.

But next June the armed forces will have increased to such an extent that the $14.4 billion level will not be high enough to allow pay for the larger military force and still maintain the amount of munitions procurement ($4 billion) established in the 48-49 budget.

The result, they fear, is that unless Russia next year is much harder to get along with, Congress will not give them the $17 billion budget which will be minimum to keep them at the status quo established this fiscal year.

With the men already in uniform a lower budget would mean dropping or drastically reducing munitions procurement—including planes. Military observers recall that President Truman diverted Air Force research and procurement funds to pay for the Army to meet a fiscal 1947 shortage in housekeeping funds.

For the Record

Automatic flight control project of the Air Force All Weather Flying Center was organized in 1945 under the direction of Col. Ben Kelsey, then Center Commander. First completely automatic flights were made with a C-54 in February, 1946.

Original project officers were Majors Breedlove and Biggers. Robert Frazier and James Anast, civilians, assisted with electronic engineering. Capt. Thomas Wells succeeded Biggers as flight project officer and supervised most of the completely automatic C-54 cross-country flights including the highly publicized trans-Atlantic hop to England.

Col. James H. Gillespie succeeded Kelsey as center commander in July, 1946, and accompanied several automatic C-54 flights including the trans-Atlantic trip. Col. Gillespie was awarded the Thurman H. Bane award given annually by the Institute of Aeronautical Sciences to Air Materiel Command personnel for the outstanding aeronautical development of the year. Gillespie gets the award this year for being "responsible for the preparation of the aircraft and the execution of the first long-range push-button flight."

Air Force Changes

Air Defense Command has reorganized its nation-wide network of Air Forces reducing their number from six to four effective July 1. The First Air Force absorbs the Eleventh Air Force and is responsible for the aerial defense of the Northeast coast of the country. The Tenth Air Force absorbs the Second Air Force and assumes responsibility for the Middle West states.

The Fourteenth Air Force is expanded to encompass the entire Southeast, South and Southwest area while the Fourth Air force remains in charge of the Pacific Coast. Air Defense command headquarters remain at Mitchel Air Force Base, N. Y.

NEWS DIGEST

DOMESTIC

President Truman's emergency fact-finding board investigating National Airlines dispute with striking pilots, clerks and mechanics completed its hearings and will issue its report by Aug. 1.

A. Felix du Pont, sr., former vice president and great grandson of the founder of E. I. du Pont de Nemours & Co., died at Rehoboth Beach, Del., at the age of 69. He was the father of the late Richard C. du Pont, founder of All American Aviation.

CAA established a Safety Regulation Bureau and a Safety Investigation Bureau. The new bureau established separate offices of the two former branches of the Safety Bureau. John W. Chamberlain is director of the new SRB and William K. Andrews is director of the new SIB. Both headed their respective branches of the Safety Bureau.

Pan American Airways navigators, members of the Transport Workers Union (CIO), picketed PAA's La Guardia Field terminal to protest the company's discharge of navigators who do not hold pilot licenses.

Navy has issued a call for 2000 new Naval Aviation cadets within the next 30 days. Applicants must have two years of college and agree to four years of active duty upon completion of the flight course.

FOREIGN

Radio Moscow reports more than 20 new airlines have been opened in Russia during the past two months and that trunklines now connect Moscow with the capitals of all Soviet Union Republics and with major industrial centers. Russian airfreight volume increased 40 percent between June, 1947, and June, 1948.

Government of Costa Rica signed a five year agreement for the carrying of all airmail within the country with Lineas Aereas Costarricenses, S. A. (Laesa), an affiliate of Pan American World Airways. The contract previously was held by TACA, Inc., of Costa Rica.

International airlines operating across the north and south are recommending to their governments that laws remain fixed until Mar. 31, 1949. Present rate resolutions expire Aug. 31.

India and Sweden have signed a bilateral agreement for an exchange of air route privileges in their respective countries. The Swedish route extends through Pakistan, Delhi, Calcutta and to Burma and Siam.

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USAF, Navy Step Up Jet Engine Buying

Gas turbine types to be 55% of 1949 purchases; Allison getting largest share.

By Robert McLarren

Emergence of the turbojet engine as the primary production type looms early next year with more than 55 percent of fiscal 1949 engine procurement earmarked for jet types. Leading the jet engine production parade is Allison Division, General Motors Corp., with more than 65 percent of all U. S. jet engine production centered in its Indianapolis plants.

Aircraft engine production will be doubled during the current fiscal year with unit output of all types crowding the 1000-per-month rate by the end of next year. Most companies will add facilities and all will require a substantial increase in personnel. An approximate breakdown of the 1949 engine production picture follows:

▶ **Allison**—Will build 1875 Model J-35 turbojet engines for the Air Force Republic P-84, Northrop B-49A and Curtiss F-87 interceptor version. The Lockheed P-80 type contracts (F-80C, TF-80, etc.) will require 1640 model J-33 centrifugal-flow turbojet engines. Navy will buy 338 J-33s for use in the Grumman F9F Panther and the Martin P4M composite-powered search plane, a total of 1978 J-33 models.

Current Allison output of about 200 engines per month will be increased slowly to a peak rate in December, 1951, at which time about 500 engines per month will be turned out. Allison will need about 1000 additional workers during next year, but present production facilities, expanded during the war, are expected to prove adequate for the job.

Subcontracting will continue at a substantial rate with rotors, stators, burners (solar) and buckets (Thompson Products) being purchased. Allison is rapidly developing its own turbine blade production techniques with plans for manufacture of its own blades in the near future.

▶ **Westinghouse**—Present facilities at Essington (South Philadelphia) have a practical volume of about 100 engines per month which will be pushed to the limit in meeting the current Navy Commitment for 1278 Model J-34 (24C) axial-flow turbojet engines. Company has received a $750,000 letter of intent against a full $50 million award for this quantity of engines.

Navy plans a substantial increase next fiscal year causing Westinghouse to conduct a current study of additional facilities in the Middle Atlantic area. Westinghouse will need additional machine tools and added personnel during the coming year to meet the present program. Subcontracting will remain small with only accessories and similar standard items being purchased. Company is conducting extensive development program on turbine blade fabricating techniques and is investigating respective merits and production costs of precision cast, forged and machined blades.

▶ **General Electric**—Air Force orders for about 1250 Model J-47 (TG-190) engines comprise only a preliminary award to be followed by gradual increase through 1952. To meet this heavy commitment, the company has leased major portion of the former Wright Aeronautical plant at Lockland, Ohio. The 700,000-sq. ft. facility will employ about 2000 workers and will comprise an assembly plant with major

GILLESPIE AND HOOVER HONORED

Col. James M. Gillespie, retired chief of the Air Force All-Weather Flying Division, has been named winner of the 1948 Thurman H. Bane Award for being "responsible for preparation of the aircraft and execution of the first long-range push button flights." The Institute of Aeronautical Sciences makes the citation annually to an officer or civilian of the Air Materiel Command for outstanding achievement in aeronautical development during the year. Gillespie is now assistant to the president of the Garrett Corp. Herbert Henry Hoover (right), NACA supersonic flight test pilot of the XS-1, receives the 1948 Octave Chanute Award "for his contribution to the applications of flight test procedures to basic research in aerodynamics and the development of methods for the scientific study of transonic flights." Both awards will be made at the I.A.S. summer meeting this week in Los Angeles.

portions of the fabrication being by subcontractors

Main facility at Lynn, Mass., will continue to fabricate all parts of the J-47 engine and will increase production by additional space and machine tools Lynn will also quadruple production of turbosuperchargers used on the Pratt & Whitney Wasp Major and other engines

▶**Pratt & Whitney**—Heavy increase in engine output is required under the 1949 program with both Air Force and Navy ordering well over $100 million worth of engines These include 634 Model J-42 (Rolls-Royce Nene) turbojet engines for the Navy Grumman F9F Panther, 2756 R-4360 Wasp Major reciprocating engines for the Boeing B-50, Douglas C-124, Fairchild C-119, Martin AM-1 Mauler and others, 253 R-2800 double Wasp engines, and 97 R-985 helicopter engines Company can meet these requirements with present facilities and slight increase in personnel Subcontracting will continue heavy with the famed Hartford-area "complex" of machine shops increasing their output

▶**Wright Aeronautical**—New Model R-1300, a type developed in 1937, dropped during the war, and redesigned for use in the Lockheed and Boeing feederliners, will go into quantity production for the new North American T-28 high speed Air Force trainer A total of 665 R-1300s are required under the current program with a substantial increase indicated in the near future New Wright R-3350 double-row radial will increase in production with Navy requiring 682 for its Douglas and Skyraider program as well as the Air Force Lockheed C-121 and other projects requiring 100 engines

Also needed are 96 R-1820 engines for the Grumman Albatross procurement, both Air Force and Navy Current facilities can meet this $50 million program but additional personnel and machine tools will be required. Subcontracting will continue heavy in the New Jersey "complex" of small machine shops feeding the big Wright plant

▶**Cost Reduction**—Major problem concerning both services at the moment is the high cost of turbine blades, which require special heat-resistant and high-strength alloys and fabricating techniques Blade costs now run from $6 to $24 each and all contractors have received urgent support in programs to evolve new production methods

Some companies are already making progress along this line and most promising long-range development is the use of extruded lengths which can be cut off to the desired blade length. Formed sheet metal and precision casting are also being developed with an Air Force goal of 50 cents per blade the mark the industry is shooting at.

Airport Projects Listed for 1949

Jobs range from $202 at Menard, Tex., to $4,750,000 at Chicago; Federal funds 47% of $73,819,455 total.

Expenditure of $73,819,455 on 455 new airport projects and additions to existing projects is scheduled in fiscal year 1949 under the federal-aid airport program, Delos W. Rentzel, Civil Aeronautics Administrator has announced

Of the total, $35,098,459 is federal aid, the rest coming from local or state sponsors of the individual projects

▶**Chicago Largest Project** — Largest single federal allotment was to the Chicago Orchard (Douglas) Airport, totaling $1,775,000, in addition to a sponsor contribution of $2,975,000 for a total investment of $4,750,000. A master plan approved by CAA for this field will will make it the largest civilian field in the country, with over 6000 acres, and with ten runways of 8400 ft. each.

Ft Worth Midway Airport was listed for a federal grant of $600,000 despite objections to the proposed grant voiced by Dallas spokesmen.

Ft. Worth as local sponsor is contributing $900,000 in addition to the federal grant A grant of $340,000 in federal funds had previously been allocated in the 1947-48 program. This amount, still unexpended, is for preparation of the site and access roads and parking area. Dallas opposition to the airport was based on contention that it would interfere with future development of Dallas' Love Field

▶**Projects Listed**—Airport aid projects and total dollar expenditures listed by CAA in the program include

Alabama, $92,152; Anniston, 55,240; Birmingham 207,000; Decatur Field, 108,722; Florala 20,500; Gadsden, 60,000; Montgomery Dannelly Field, 670,130; Wetumpka, Elmore Field, 3500

Arizona 730,340; Benson, 18,000; Clifton, 14,100; Clemenceau Cinwd, 11,000; Duncan, 5800; Flagstaff, 10,584; Globe Miami, 23,078; Holbrook, 20,245; Nogales 12,700; Phoenix 476,510; Prescott Ernest A Love Municipal, 84,200; Springville Eager 32,500; Superior, 1054; Tucson, 21,120; Williams 1054; Yuma, 41,280

Arkansas, 870,354; Blytheville, 40,000; Camden Harrell Field, 130,700; El Dorado 20,000; Fort Smith 600,854; Jonesboro 10,000; Morrilton, 31,050; Newport 15,000; Springdale, 5300; Stuttgart, 95,550

California, 6,278,475; Bieber, 2800; Borego 12,004; Concord, Buchanan Field 145,000; Eureka, Humboldt Co No. 1, 275,800; Fontana, 24,068; Fort Jones 8700; Fresno Hammer Field, 80,000; Garberville 60,200; Hanford, 54,461; Hawthorne, 35,501; Hayfork 3049; Hayward 18,495; Imperial, 73,978; Lompoc 23,761; Long Beach 115,432; Los Angeles, 667,213

Marysville, 14,550; Monterey 224,336; Oakland 194,945; Orland Haigh Airport 70,000; Oxnard Ventura County 28,875; Palmdale 468,924; Pismo Beach 35,000; Redding 83,280; Rialto, Morrow Field, 532,557; Sacramento, 505,956; San Francisco, 1,206,905; San Luis Obispo 9425; Santa Monica, 80,000; Santa Rosa, Sonoma County, 85,000; Susanville, 24,540; Trinity Center, 10,041; Tule Lake 10,000; Visalia, 86,400; Yuba City, 43,501

Colorado, 874,820; Denver, Stapleton Airfield, 500,160; Grand Junction Walker Field Municipal, 100,000; Gunnison, 100,000; Trinidad, 30,002.

Connecticut, 390,000; New Haven, 390,000

Delaware, 360,000; Wilmington, New Castle Municipal, 360,000

District of Columbia—No 1946 program as of July 1, 1948

Florida, 1,506,700; Daytona Beach, 558,700; Miami, 950,000, Tallahassee, Dale Marbry Municipal 200,000

Georgia, 2,100,000; American Southern Field 20,000; Atlanta, 1,170,000; Augusta, Bush Field 200,000, Columbus, Muscogee County 540,000; Darien McIntosh 32,000; La Grange, Calloway Airport, 62,000; Tifton 50,000

Idaho, 190,701; Boise, 73,000; Craigmont 32,501; Idaho City, 14,750; Pocatello, 71,000; Priest Lake 14,210.

Illinois, 9,048,000; Alton Civic Memorial 900,000; Cairo, 425,000; Carbondale Murphy 220,000; Charleston Mallood 340,000; Chicago, 1,250,000; Chicago Chicago Orchard 4,750,000; Danville Vermilion County, 500,000; Harrisburg, Raleigh, 130,000; Lincoln, Logan County, 245,000; Marion Herrin Williamson County 300,000; Peoria 80,000, Rockford, 800,000; Springfield 100,000; West Chicago, Du Page County 212,000

Indiana, 2,031,000; Bloomington, Kisiere Field 140,000; Evansville, 225,000; Gary, 1,000,000; Indianapolis, Weir Cook Municipal, 500,000; Kokomo, 60,000; Richmond, 60,000; South Bend, St Joseph County, 820,000; Valparaiso, Porter County 76,000

Iowa, 1,725,187; Boone 42,000; Burlington 150,000; Clarinda, 22,000; Clinton 70,000; Denison 12,612; Des Moines, 600,000; Dubuque 30,000; Estherville 30,000; Fort Dodge 60,000; Jefferson 35,000; Keokuk, 324,500; Knoxville 60,075; Northwood, 25,000; Perry, 12,000; Sheldon, 47,210; Waterloo 134,000; Waverly, 71,500

Kansas, 1,028,384; Coffeyville, Municipal No. 1 10,000; Garden City 31,600; Horger, 400; Horton, 6000; Hutchinson, 250,000; Junction City, 12,000; Liberal, 17,500; Osawatomie Paola 70,250; Pittsburg Atkinson Municipal 94,150; Russell, 24,000; Topeka, Philip Billard Municipal, 346,784; Ulysses, 76,500; Wichita 100,000

Kentucky, 1,043,343; Georgetown, 60,000; Hazard 45,000; Louisville Standiford Field, 335,000; Owensboro, 599,858; Paducah, McCracken County Airport 40,000; Williamstown 62,000

Louisiana, 715,485; Abbeville, 35,600; Homer, 95,410; Lafayette 36,540; Mande ville 79,770; Marksville 95,035; New Iberia, Iberia Parish Airport 40,000; New Orleans Moisant International, 216,820; Welsh 115,160

Maine—No 1949 program as of July 1.

Maryland, 2,100,000; Baltimore Friendship Ch Site, 2,000,000; Easton, 40,000; Frederick 120,000; Salisbury 30,500

Massachusetts, 1,649,000; Bedford, 240,000; Fall River, 250,000; Fitchburg, 30,000; New Bedford, 60,000; North Adams, Stevens 200,000; Pittsfield, 275,000; Worcester, 200,000

Michigan, 3,451,400; Battle Creek Kellogg Field, 60,000; Detroit, Detroit City Municipal, 300,000; Detroit Wayne County, 2,623,200; Freemont, 20,000; Ironwood, 52,000; Lansing, Capitol City Airport, 40,000; Muskegon, 140,000; Northport, Clinton Woolsey, 14,200; Pontiac, 60,000; Port Hinron St Clair County Municipal, 40,000; South Haven City Airport, 30,000; Sturgis, Kirsh Municipal, 24,000

Minnesota, 1,482,500; Crookston 42,000; Detroit Lakes 50,000; Fergus Falls 78,000; Glenwood, 40,000; Grand Marais, 40,000; Little Falls 50,000; Mankato 200,000; Minn. St. Paul Flying Cloud Airport, 211,000; Minn. St. Paul Twin Cities, 330,000; Owatonna, 61,000; Pipestone, 60,000; St. Cloud 60,000; Thief River Falls, 40,000; Winona, 60,000; Worthington, 40,000

Mississippi, 518,044; Brookhaven, New Municipal, 91,400; Grenada, 25,000; Gulfport, 14,000; Jackson Hawkins Field, 300,000; Laurel, 26,000; Meridian, Key Field 50,000, Vicksburg, 52,104

Missouri, 632,216; Albany 8000; Branson, 14,030; Cape Girardeau, Harris Field 58,380; Excelsior Springs, 76,900; Gallatin Daviess County, 25,000; Kennett, 82,000; Maryville, 10,000; Nevada, 60,000; St. Joseph 280,000; Unionville, 31,800

Montana, 813,607; Billings 130,729; Great Falls, 12,954; Kalispell, Flathead County 37,800; Lewistown, 10,000; Miles City, 16,324

Nebraska, 1,204,035; Bayard, 90,270; Bloomfield 24,500; Burwell 35,000; Curtis, 40,500; Dunning 30,200; Harrison, 21,200; Hastings 62,250; Kearney, 70,000; Minden, 45,190; Omaha, 616,000; Pawnee City 44,000; Red Cloud 60,815; Sargent, 61,000; Valentine 8000; Wahoo, 10,000; Wauneta, 65,000; West Point, 44,000

Nevada, 216,050; Boulder City 2460; Elko 24,000; Las Vegas Clark County Airport, 182,000; Mesquite, Mesquite Bunkerville 8250

New Hampshire, 982,770; Berlin 50,000; Concord 60,000; Manchester, 70,000; Nashua, Boire Field, 71,500; Portsmouth, 82,820; Whitefield, White Mt. Air Terminal, 49,550

New Jersey, 1,200,000; Atlantic City, 100,000; Atlantic City Municipal 100,000; Newark 1,000,000

New Mexico, 1,062,902; Alamogordo, 224,800; Aztec 50,025; Carrizozo 47,000; Clayton, 62,000; Dexter 42,056; Hagerman, 20,000; Hobbs Lea County Airport, 276,527; Hot Springs, 57,800; Las Cruces, 82,000; Questa, 17,100; Ray, 84,500; Santa Fe, 89,000

New York, 9,216,000; Albany, 600,000; Binghamton Tri Cities 65,000; Binghamton Broome County 1,220,000; Buffalo, 200,000; Callicoon, 30,000; Ellenville 102,000; Elmira Chemung County, 108,000; Islip Mararthur, 92,000; Jamestown 150,000; Massena, 100,000; New York, Idlewild, 500,000; New York, La Guardia, 1,300,000; Pleitsburgh, 100,000; Poughkeepsie, Dutchess County, 60,000; Rochester 600,000; Schenectady, 60,000; Syracuse elarence Hancock, 100,000; Utica, Oneida County Airport, 60,000

North Carolina, 1,100,053; Charlotte, Douglas Field, 40,000; Greensboro-High Pt., 644,150; New Bern Simmons Knoll Airport, 168,300; Roanoke Rapids, Halifax County, 13,000; Rocky Mount 24,500; Shelby 250,400; Wilmington Binalhenthal, 160,000; Winston Salem Smith Reynolds Airport 77,702

North Dakota, 58,000; Carrington, Mathieu Field, 20,000; Dickinson, 30,000

Ohio, 2,276,000; Canton Akron 60,000; Chardon 14,000; Cleveland, 200,000; Columbus 650,000; Dayton 140,000; Jackson Wellston, 33,000; Marion 130,000; Salem 246,000, Springfield 94,000; Toledo Gleudale 800,000; Youngstown 320,000, Zanesville 40,000

Oklahoma, 1,480,522; Ardmore, 59,380; Blackwell, 110,750; Boise City, 11,780; Brielow, 50,700, Broken Bow 62,500; Buffalo, 23,570; Chandler, 7,800; Cherokee, 41,200; Edmond 45,000; Guymon 36,900; Hollis, 33,300; Hooker, 3800; Langston, 6730; Lawton, 116,750; Lexington Purcel, 82,270; McAlester, 404,600; Marietta, 4,000; Norman Max Westheimer Field 15,567; Oklahoma City 16,450; Pauls Valley, 33,545; Penca City, 116,750; Stillwater, Searcy Field, 44,650; Stillwater Lake Carl Blackwell, 58,260; Temple 11,780; Watouga, 58,809; Wewoka, 21,770

Oregon, 425,235; Eugene Mahlon Sweol Municipal, 23,214; North Bend, 36,000; Portland 207,957; Redmond, Roberts Field 26,750; Salem, McNary Field, 71,429

Pennsylvania, 4,821,088; Allentown 474,500; Beaver Falls Beaver County, 175,000; Bradford 60,650; Eagles Mere 6000; Emlenton, 14,000; Erie Port Erie, 427,000; Franklin Chess Lamberton Memorial 261,400; Harrisburg 40,000; Martinsburg, Altoona Blair County 165,800; Oil City, Spleen Memorial, 218,000; Philadelphia (Mnu sw), 1,140,000; Pittsburgh Greater Pittsburgh, 1,140,000; Pnuxsatawney 18,400; Wilkes Barre, 40,000; Williamsport, 22,000

Rhode Island, 160,994; Block Island, 155,984

South Carolina, 551,000; Charleston 64,000 Gaffney 108,000, Greenwood Coronaca Airfield, 163,000; Union, 108,000; Winnsboro 109,000

South Dakota, 805,854; Aberdeen 209,500 De Smet 64,800; Rapid City 320,564; Sioux Falls 36,000; Watertown, 185,000

Tennessee, 1,761,900; Bristol Tri Cities, 200,000; Brownsville 59,900 Chattanooga, Lovell Field, 935,650; Columbia, 131,800; Cookville, 21,500; Knoxville, McGhee Tyson, 200,900; Lexington 19,800; Meridian ville Warren City Memorial, 26,900; Milan 95,400; Paris 35,000, Waverly, 24,000.

Texas, 6,535,032; Abilene Tye Field, 60,000; Alice, 65,000; Amarillo English Field, 180,000; Bay City, 201,600; Beaumont, Jefferson County, 737,200; Big Spring 52,000; Bonham Jones Field, 41,500; Breckenridge, 40,000; Brownwood, 80,000; Carrizo Springs, Dimmit County Airport 58,000; Cellers Station Easterwood 10,400; Corsicana, 204,500; Dallas Love Field 285,000; Deleou, 32,000; Del Rio Val Verde County 50,000; El Paso, Andersen Field Municipal, 100,000

Fort Worth Midway 1,700,000; Fredericksburg Gillespie County, 35,000; Freeport, Brazoria County 100,700; Greenville, Majors Field, 40,440; Harlingen 90,000; Houston 217,000; Huntsville 70,000; Jasper, 40,000; Laredo 80,000; McCamey 70,000; Marshall, Harrison County 160,000; Menard 202; Mineral Wells 40,000; Mineola, 31,000; Palacios 40,480; Pleiview, Hale County Airport, 140,000; Quanah, 28,004; San Antonio Stinson Field 16,000; San Antonio 150,000; Seminole 61,000; Sweetwater 20,000; Temple 10,000; Texas City 150,000; Vou Horn Culberson County 27,000; Verneu Wilbarger County 48,000; Waco, 128,000, Wellington, Marian Airpark 5478

Utah 754,400; Cedar City 109,546; Heber, 67,560; Hurricane 99,250; Junction 20,100; Ogden, Robert H. Hinckley 40,440; Price Carbon County, 109,050; Richfield, 251,520; Salt Lake City (Mun 2) 50,000

Vermont, 169,942; Burlington, 117,442; Randolph, 52,500.

Virginia, 1,181,000; Danville 129,000; Newport News Patrick Henry Airport 400,000; Norfolk 450,000; Richmond Richard E. Byrd Field, 200,000; Roanoke 151,000

Washington 2,291,030; Bellingham, 82,000; Ellensburg Bowers Field 58,000; Everett Paine Field 65,000; Olympia, 49,000; Raudle 55,500; Renton 23,000; Seattle Seattle Tacoma, 950,000; Seattle Boeing Field, 100,000; S. Bend Raymond Willapa Harbor 10,000; Stevenson 55,500; Tacoma 584,000; Wenatchi, 60,000; Winslow Whistle Bainbridge Island, 52,000; Yakima, 241,500

West Virginia, 944,800; Bluefield, Mercer County Airport, 695,300; Charleston, Kanawha County Airport 80,000; Fairmont 40,000; Harrisville Ritchie County 22,500; Huntington, 57,000; Spencer, Roane County, 30,000

Wisconsin, 1,194,200; Ashland, 44,000; Cable, 11,000; Clintonville 100,000; Cornell Helcombe, 21,100; East Troy, 40,000; Lacrosse, 100,000; Marshfield 95,600; Milwaukee, 500,000; Oshkosh, Wiuebago County Airport, 100,000; Port Washington, Ozaukee County, 50,000; Richland Center, 27,000; Washington Island, 10,000; Wausau, Alexander Municipal, 50,000; Waukomo, 35,000

Wyoming—No 1949 program as of July 1, 1948

British to Order Canadian DC-4Ms

The British cabinet last week was considering a compromise solution to its "fly British" dilemma Purchase of additional Constellations was considered unlikely, approval going instead to Canada-built DC 4Ms

T. J. Emmett, vice president of Canadair Ltd., Montreal, said a special British cabinet subcommittee had contracted to buy 20 of the DC-4M craft for British Overseas Airways Corp., with official announcement from London to follow

The compromise was proposed after a two-to-one committee split Lord Addison, chairman, and Lord Pakenham, new minister of civil aviation, favored temporary abandonment of the fly British policy until suitable British transports are available, and the purchase of the DC-4Ms in the meantime George Strauss, minister of supply, opposed the plan

Two months ago, BOAC bought five Constellations from Irish Air Lines at $1,260,000 each, for use on its Australia run The DC-4Ms have pressurized cabins and British Rolls Royce Merlin engines, and are in use on trans Atlantic and domestic transcontinental routes of Trans-Canada Airlines

But this solution, or any other compromise, is bound to be unsatisfactory and merely adds another type to the BOAC fleet, with resultant maintenance complications

Moreover, DC-4M performance is matched closely by the Hermes IV, whose prototype is due to fly soon, with delivery from full-scale production at the rate of one a week promised by Handley-Page beginning Jan. 1.

Meanwhile, AVRO is converting the 16 rejected Tudor I transports into the Tudor IV version now being flown by British South American Airways, and the company may succeed in exerting pressure on BOAC to accept those in excess of BSAA needs

Hope was fading for an American-financed deal to allow BOAC to buy more Lockheed Constellations

BOAC and Lockheed approached the Export-Import Bank about three months ago regarding a $22,200,000 loan to finance purchase of from 18 to 20 Constellations by BOAC The Bank approved the loan in principle and indicated it would finance whatever balance remained after private financing arrangements had been completed.

▶**Opposition**—Since then political pressure has built up strong opposition to the loan on both sides of the Atlantic It is now doubtful if BOAC will even make formal loan application to the Bank

FSF GETS A BOOST with a check from Sherman Fairchild for the Richard Henry Depew, jr, Memorial Fund. Left to right, Mrs. Depew, widow of the pioneer safety advocate, Fairchild, FSF President Jerome Lederer, Vice President Hugh De Haven.

Safety Foundation Lists Projects

Independent group plots research work on variety of safety factors. Fairchild finances private flying study.

After a quiet organizational period, Flight Safety Foundation, the nonprofit research group headed by safety engineer Jerome Lederer, is about ready to take off the wraps.

It has a new office in New York City, a new research center at Woods Hole, Mass., a small, but experienced research and engineering staff, an initial list of 12 projects—and the almost certain prospect of getting government contracts.

FSF has just received the first of what is expected to be a series of contributions from Sherman Fairchild to set up the Richard Henry Depew, jr., Memorial Fund for promotion of greater safety in private flying. Depew, onetime associate of Fairchild in aircraft manufacturing, began flying in 1911 and until his death last January was an outstanding exponent of greater safety in private flying.

▶**Beginnings**—Despite the Fairchild donation, financing is still one of FSF's major concerns—although the government work should ease some of the pinch. The financing job is complicated by two factors. First is the newness of a non ax-grinding safety research group. There never has been anything quite like FSF in aviation.

It was founded in 1945 to "advance the art and science of safety in the operation of aircraft." It was largely inactive until Jerome Lederer moved in earlier this year after the insurance firm of which he was director of engineering abandoned aviation business.

To some extent, FSF—to which Lederer will give full time beginning next month—is a continuation of Lederer's work for the insurance company, but with one important exception. There he was concerned with promoting safety ostensibly, at least, to protect the underwriter's interest. FSF is studying safety for safety's sake—and to aid aviation.

That highlights the second complicating factor in fund raising. Lederer feels it is important that no segment of aviation be such a large contributor that it would attempt to dictate the direction and extent of FSF's work, or (just as bad from Lederer's viewpoint) FSF could be suspected of protecting the interests of any one segment of aviation.

▶**Projects**—Just how FSF will function, and the likelihood that it will step on some one's toes in the process, are indicated in the list of projects already approved by the board of governors:

- An award to fixed base operators for outstanding safety records.
- Training of aircraft accident investigators for state governments.
- Dissemination of confidential information on accidents (Lederer already is doing this).
- Investigate obstructions to air navigation, such as the power plant near the south end of Washington National Airport's instrument runway.
- Assist manufacturers and airlines to establish loss prevention departments.
- Research on sea survival and ditching problems.
- Establish standards to simplify maintenance.
- Improvement in flight instruction.
- Simplification of cockpit design and instruments.
- Weather analysis and study of weather inconsistencies (now being done in cooperation with the Weather Bureau by providing pilots with cards on which they jot down observance of unpredicted weather conditions).
- Foster a sense of safety among airline and fixed base operator employes.
- Safety problems of personal planes.

▶**Staff**—Some of these projects already have been assigned to key staff members of Flight Safety Foundation with one of the toughest, personal planes, the elected task of Eugene Norris, until recently vice president-engineering of Luscombe, who will be FSF's Washington representative.

Gloria Heath, Lederer's assistant and a former WASP, will work on weather, flight training and the training of accident investigators.

Walter Johnson, former director of industrial safety for American Airlines and until recently with the Airlines Terminal Corp., probably will head up the loss prevention department work.

David K. Morrison, secretary and a founder of FSF and onetime Martin, Sikorsky and Navy engineer, will work on the sea survival project and probably follow the work on cockpit simplification, a type of research he originated in 1944 for the Special Devices Division of the Bureau of Aeronautics.

Also active in the picture is Hugh De Haven, FSF vice president and director of Crash-Injury Research, and Richard T. Crane, an FSF founder, vice chairman of the board, and recipient of official commendation for work with Crash Injury Research and BuAer's Special Devices Division. FSF board chairman is Eugene F. Du Bois, chairman of the National Research Council Committee on Aviation Medicine.

Who Can Fly?

Research into the question of which hospital patients should not be permitted to fly will be one of many studies conducted at the University of Illinois' Aero Medical and Atmospheric Institute when it opens in September.

Other studies will be made on the effect of high altitude, effect of small changes of barometric pressure on arthritic and rheumatic patients and the effect of high altitude on the senses of smell and taste.

The $400,000 Aero Medical Institute will be operated by the college of medicine on the campus of the Chicago Professional Colleges. It will be equipped with apparatus for the study of aviation medicine, and of cold, heat and barometric changes of the body.

Dr. John P. Marberger will direct research.

"Petulant Porpoise" Tests Hulls

Interchangeable hull is feature of research plane used to try out new designs for flying boats.

Flight tests have begun on the first interchangeable hull research airplane.

Plane is the "Petulant Porpoise," modified Navy Grumman J4F-2 Widgeon Amphibian redesigned by Edo Aircraft Corp., College Point, N. Y.

Program is a joint Navy-National Advisory Committee for Aeronautics project designed to investigate at full scale the already promising features of new hull shapes developed by NACA during the war.

These include the planing tail design, in which the hull afterbody is extended to the tail; high fineness ratio hulls, in which the shape is long in relation to width; and various "step" locations and shapes.

▶**NACA Tests**—The flight tests will be conducted at the NACA Langley Memorial Aeronautical Laboratory, Langley Field, Va., by both NACA and Navy pilots and engineers. Flight and water test instrumentation, developed by NACA, will be carried throughout the airplane and high-speed camera installations on shore will record water takeoff and landing runs.

The "Petulant Porpoise" is equipped with an easily detachable hull to facilitate the interchangeability of various shapes. This removable portion includes the entire bow and bottom extending to the tail. This change required considerable redesign of the flight deck and installation of special controls and provisions on a floor that is much higher than the one available in the standard Widgeon.

▶**Martin Hull**—First hull to be tested is a replica of the design developed by the Glenn L. Martin Co., and it is now being tried out on the XP5M-1. It features an extended afterbody and increased length-beam ratio. Second hull will be a replica of the type to be used on the Convair XP5Y-1 and features an even higher fineness ratio. Third hull will be the unique NACA planing tail design which is distinguished by a "soup ladle" afterbody design with a small planing surface located at the stern.

This type, although not yet scheduled for design installation on a new flying boat project, is regarded as the most promising of the group, but its fullest exploitation requires further research at full scale.

All of these hulls have demonstrated superior water and air characteristics in design analysis and in towing tank tryouts.

The long afterbody of the hull on the Petulant Porpoise carries the tail of the hull higher which permits the craft to go "over the hump" and onto the step at a lower trim angle than the conventional hull. This greatly reduces the hull drag as the hump is approached and is a strong deterrent to "porpoising" after the hull is riding on the step. By the same token, the tendency of the hull to "skip" during landing is greatly reduced.

The NACA planing tail hull design possesses all of these features plus greatly reduced air drag and consequent improvement in performance. This is made possible by improved aerodynamics of the "neck" of the soup ladle over the poor aerodynamics of the conventional hull in the area of the hull stern.

New Chief of MATS Continental Division

Continental division of the Military Air Transport Service has been activated under command of Maj. Gen. Bob Nowland with headquarters at Kelly Field, San Antonio, Tex. Capt. D. W. Tomlinson, USNR, and formerly of TWA, will be deputy commander. This completes organization of MATS.

Continental division will operate an eight trip a week transcontinental service replacing the Navy's "Hotshot" and the Air Force "Statesman." Eastern terminals have already been consolidated at Washington, D. C., with the western terminals in process of consolidation at the Air Force Fairfield-Suisun base near San Francisco.

▶**Other Functions**—Among its other functions the continental division will: operate the former Navy routes to Port Lyautey in Morocco and the Caribbean, provide trunkline service between the four U. S. aerial ports of embarkation and Air Materiel Command and Navy supply depots, operate domestic feederline service to connect with transcontinental trunklines, handle air transport to Alaska, and supervise the MATS special mission fleet based at Washington National Airport.

Continental division will have 4000 men and aircraft including 65 C-47s, 69 C-54s and one C-97.

ANG Converts to Jets

Conversion of Air National Guard fighter squadrons to jet aircraft is well under way with 42 Lockheed F-80C jet fighters already delivered to ANG squadrons.

Total of 107 F-80Cs was purchased by the National Guard from fiscal 1948 funds. This is the first move in a new program to provide ANG with the same modern aircraft as are used by regular Air Force units. The F-80C is in service with the USAF Fourth Fighter Wing, Andrews Field, Md.

The new Shooting Star is powered by a 4600-lb. thrust Allison J-33-23 turbojet engine, which gives it a top speed of 600 mph. It is armed with six M3 .50-caliber machine guns with increased rate-of-fire over earlier P-80 fighters. It is also equipped to carry two 1000-lb. bombs in wing-tip shackles.

INDUSTRY OBSERVER

▶ Douglas Aircraft Co test pilots are still flying the D-558-2, Skyrocket, one of the series of supersonic research planes built for the joint Air Force, Navy, NACA high speed flight research program. Skyrocket is powered by a Westinghouse 24C jet engine and the type of Reaction Motors rocket motor used in the Bell X-1. Industry observers believe the Skyrocket will achieve supersonic speeds more easily than did the X-1 and eventually hit higher Mach numbers. It is designed to reach Mach 2.5.

▶ Latest Navy night fighter, the twin-jet Douglas F3D is still undergoing flight tests at Muroc. Douglas has an initial order for 28 of these planes.

▶ Navy is modifying a carrier of the Essex class to take larger aircraft than now are in carrier service. Modifications will include beefed-up catapults, reinforced deck, and enlarged elevators. The modified carrier probably will be used for interim testing of new Navy carrier-based types until the 65,000 ton super-carrier prototype is ready for use. The super carrier will take at least four years to build.

▶ Swedish Saab J-29 (page 33) combines features of Grumman Panther, McDonnell XF 85 and North American F-86A to produce best-looking European jet aircraft yet revealed. A combat plane, the J-29 mounts four 20 mm. cannon. Wings have popular anhedral to compensate for increased effective dihedral of wing sweep. SAAB plans quantity production and prototype is scheduled to fly early in the fall.

▶ Navy is entering four North American FJ-1 Fury jet fighters in the jet division of the 1948 Bendix trophy race. The four fighters, of Fighter Squadron VF-5A, will make a fuel stop at Hutchinson, Kans. No modifications will be made to the airplanes and only standard-size tip fuel tanks will be carried. Air Force jets will not enter the race this year.

▶ Paul Mantz will try to become the first three-time winner of the reciprocating Bendix trophy race. Mantz has entered three modified North American P-51s and he will fly the Mustang that won in 1946 and 1947. Mantz' entries will be backed by Glenn McCarthy, wealthy Houston, Tex., oil man and hotel operator.

▶ Handley-Page will set up a subsidiary company to take over production of the Marathon, British 20-passenger feederliner, from the now defunct Miles Aircraft Co. The Marathon will be built in two versions, the first powered by four 330 hp. Gipsy Queen piston engines and the second with two 1100-hp. Armstrong-Siddeley Mamba turboprops. First prototype was recently destroyed in a crash after takeoff.

▶ USAF is steadily increasing the amount of magnesium used in military aircraft, particularly in high speed fighter types. Demand for magnesium by airframe manufacturers already is substantially higher than its peak wartime use in aviation.

▶ Crash of a British Tudor II prototype last August killing Roy Chadwick, chief designer of A. V. Roe Ltd., among others, was officially blamed on reversed aileron control chains. The chains apparently were reversed inadvertently during modifications made as part of the prototype test program, and slipped by final ground inspection.

▶ Lockheed plans to install the Wright compound engine in the R60-1 Constitution experimentally and in the P2V-4 Neptune in production. The new Wright engine, a modified R-3350 Cyclone with three turbo-superchargers geared back into the engine, develops 3200 hp. and is expected to show a specific fuel consumption of only 0.36 lb. per hp./hr. The standard Cyclone develops 2100 hp. and has a specific fuel consumption of 0.45 lb. per hp. per hr.

▶ USAF plans to expand its pilot training program to produce 3000 pilots during the next year. Bulk of aviation cadet recruiting will be from colleges and universities.

LAES Director to Brazil

Brazil's Institute of Aeronautics, set up as a combination NACA, Wright Field and MIT, has gone to the technical staff of Landing Aids Experiment Station in search of personnel. As a result, LAES, located in Arcata, Calif., the world's foggiest spot, finds itself losing key executives.

AVIATION CALENDAR

July 12—IATA administrative subcommittee, New York.
July 12—ICAO North Pacific regional meeting, Honolulu or Vancouver.
July 13-16—Institute of Aeronautical Sciences' annual summer meeting and dinner, Hotel Ambassador, Los Angeles.
July 19-24—Airport construction equipment display, American Road Builders Association, Soldiers Field, Chicago.
July 17-18—National Trading Day and All-Dixie Air Show, Chattanooga, Tenn.
July 19-21—International Sailplane contest, Samaden, Switzerland, open to U. S. contestants through National Aeronautic Association.
July 22—AIA Personal Aircraft Council meeting, Detroit, Mich.
July 23-24-25—All-Ohio Air Tour, Cleveland, Ohio.
July 23, 24, 25—Midwest Soaring Contest, Toledo, Ohio.
July 24-Aug. 1—Southwestern Soaring Contest, Grand Prairie, Tex.
July 28-31—California Aviation Trades Assn. annual state convention, San Diego, Calif.
July 31-Aug. 8—International Air Exposition, New York International Airport (Idlewild), N. Y.
Aug. 5-6—Statewide Aviation Forum, Peoria, Ill.
Aug. 18-20—Society of Automotive Engineers West Coast meeting, St. Francis Hotel, San Francisco.
Aug. 24—ICAO African-Indian Ocean regional air navigation meeting, Seattle.
Aug. 25-27—International Wakefield Trophy Model Airplane Meet, Akron, Ohio.
Sept. 4-6—National Air Races, Cleveland.
Sept. 5-11—Seventh International Congress of Applied Mechanics, Imperial College of Science and Technology, South Kensington, London, England.
Sept. 7-12—SBAC aircraft show and display, Farnborough, England.
Sept. 9—IATA legal committee, Brussels.
Sept. 13—IATA executive committee, Brussels.
Sept. 13-17—National Instrument Conference, Instrument Society of America, Convention Hall, Philadelphia.
Sept. 14-16—IATA fourth annual general meeting, Brussels.
Sept. 19-21—Twelfth International Convention, Northwest Aviation Planning Council, Vancouver, B. C.
Sept. 26—IATA executive committee, Brussels.
Oct. 3-8—National Association of State Aviation Officials, Copley Plaza, Boston.
Oct. 2-9—Society of Automotive Engineers aeronautic meeting, Biltmore Hotel, Los Angeles.
Oct. 14—Annual Air Line Dispatchers Association convention, Edgewater Beach Hotel, Chicago, Ill.
Oct. 15-24—International aircraft exhibit, Royal Danish Aeronautical Society, Copenhagen.
Oct. 17-21—National Aviation Clinic, Detroit.
Oct. 21-22—Society of Automotive Engineers production meeting, Statler Hotel, Cleveland, Ohio.
Oct. 23-28—4th Annual Arizona Aviation Conference, sponsored by Chamber of Commerce, Prescott, Ariz.

ENGINEERING & PRODUCTION

Odlum Touch Apparent at Convair

Resignation of Laddon and closing of Stinson plant at Wayne are latest moves in management change.

The way Floyd Bostwick Odlum deals with a "special situation" in aircraft manufacturing has begun to unfold at Convair.

When Odlum took over as board chairman of Consolidated Vultee Aircraft Corp. last November, persons familiar with the technique by which he has picked up a score or more of lagging enterprises, put them on their feet and sold them at a profit, waited for things to pop around San Diego. But there was no immediate action, for a good reason.

Part of the deal by which Odlum acquired control of Convair from Victor Emanuel's Avco Corp. was an agreement for hands off on management changes for six months. The agreement expired in May and LaMotte T. Cohu shortly became president, with Harry Woodhead moving up under Odlum as vice-chairman of the board.

▶ **Laddon Out**—Woodhead was brought in when Avco bought Consolidated in 1941 and his withdrawal from the presidency was foreseen in the fall of 1947. But last week brought new evidence of how thoroughly the Odlum broom is sweeping. I. M. Laddon, Convair executive vice president, retired. Cohu, also general manager, is taking over his duties. Laddon will remain on the board, but give up the engineering control he has had over Convair's products almost since he joined the company in 1927.

Odlum, through his chief aviation adviser Benjamin O. Howard, has been looking for a new engineering boss for Convair since May. Presumably he has found him, and Laddon moves out of the active engineering sphere.

▶ **Now Stinson**—Convair at last has acknowledged officially that the Wayne plant of Stinson is being closed and Stinson production being moved to San Diego. Production of the four-place personal plane is expected to be resumed at San Diego by the first of next year—but there is reason to doubt that Convair will be producing it.

Stinson has been on the block for months. Early this spring Convair thought a buyer had been found, but the deal fell through, as did two others. With the decision to close down Wayne operations, it is probable that efforts to sell the personal plane business of Convair will be pushed.

In the end, the state of the personal plane market likely will be the determining factor in the Stinson picture. The division—up to last year, at least—has been a consistent money maker. If the personal plane market looks promising, Stinson could be sold at a profit and there is no doubt that Odlum and Cohu would jump at the chance.

▶ **Next, Convaircar**—Convair's revolutionary flying auto, the Convaircar, already is dead, according to company insiders—as far as Convair is concerned. Even the former management was never too enthusiastic about the project, feeling it would require too much capital to develop and market.

The Convaircar was kept alive almost entirely by William A. Blees, Convair vice president-sales. Blees has remarked privately that if the aircraft company did not want to pursue the vehicle's development he was confident he could get outside backing for it. This may tie in with one report that Stinson would be sold to a new company and the Convaircar thrown into the deal. In lieu of cash for the flying auto, Convair would take stock in the new company.

▶ **Executive Staff**—With a new engineering chief and, probably, a new sales boss, Convair's management reshuffle in all likelihood will be completed. When Woodhead retired as president, V. C. Schorlemmer, vice president-finance, also resigned. He was succeeded by L. W. Miller who had been with Northeast Airlines, also an Odlum interest. The Odlum changes extended down to public relations, with Emmett McCabe becoming director of public relations, responsible to Cohu.

All of these moves are part of a familiar pattern, woven many times by Odlum—with variations to suit particular needs—during 25 years of prescribing for sick businesses (by a coincidence, this is also Consolidated's 25th anniversary). Odlum formed his first investment trust in 1923.

▶ **Special Situations**—The reason for Odlum's interest in Convair and other companies is basic to his investment trust. A tottering but intrinsically sound company generally can be bought cheap. Atlas acquires control, and Odlum with his drive, initiative and business acumen builds the company up. Atlas sells out.

F-86S ROLL DOWN THE LINE

An indication of progress made by North American Aviation in getting into production of its F-86 jet fighter for the Air Force is this view of the final assembly line of the company's Los Angeles plant where 674 of the fighters are being built.

at a profit and Atlas stockholders (about 30,000) get the dividends

Those are what Odlum calls "special situations," into which he moves only after careful study convinces him something beneficial can be done His most recent special situation was RKO Pictures Atlas acquired control in 1941, By the time the company was sold to Howard Hughes this year, Odlum had booked return on invested capital from 0.8 percent to 16.9 percent

▶**Profit Next Year**—In Convair, Odlum has a very special situation The company was the second largest producer of wartime airplanes Yet today it has only two announced government production contracts B 36 and L 13. The latter is for a small quantity and the former has been cut once and probably will be reduced further Stinson last year was the personal plane leader but has fallen behind in the first half of this year Convair is more than $30 million in the red on the Convair Liner

In a recent interview with "Advertising Age," Odlum said of Convair "I intend to put this company in the black for the year 1949 ..."

Obviously, that means government orders, especially if Stinson is sold and profits on the Convair Liner are as far away as they would seem One way more government money could be pumped into Convair quickly would be through some sort of a deal with Northrop Aircraft, Inc

The Northrop-Convair tie-up most often envisioned is strictly a subcontract arrangement Northrop now has large Air Force contracts but little space; and Convair has few contracts and adequate production space Cohn's knowledge of Northrop stemming from his service there as board chairman and general manager might lead to a Northrop subcontract to Convair

Labor Report

Boeing, Ryan still out; Bendix workers back; Douglas at critical point.

Labor trouble in the aircraft manufacturing industry showed slight indication of easing last week

Although workers at the Detroit and South Bend plants of Bendix Aviation Corp returned to their jobs, at least temporarily, no end was in sight for the strikes at Boeing Airplane Co at Seattle and Ryan Aeronautical Corp, San Diego

Douglas was negotiating with the International Association of Machinists for its El Segundo and Santa Monica plants, with a contract termination deadline of July 22 drawing closer Douglas talks with United Auto Workers covering Long Beach plant employes were at a stand-still, with a strike threatened on July 19

▶**Boeing Hearing** — Further developments in the Boeing situation are due today with the filing of written arguments in the National Labor Relations Board's complaint of unfair labor practices against the company After receiving these briefs, NLRB examiner William E. Spencer will issue an intermediate report and 15 days will be allowed for objections

In a two-day oral hearing preceding the filing of briefs about the only new development was Spencer's denial of an intervention plea made by the Warehousemen's local of the Teamsters' Union This gives the teamsters a .500 batting average At a federal court hearing earlier they were permitted to intervene

(This probably does not end the Teamsters interest in aircraft manufacturing Dave Beck, Teamsters' West Coast boss, indicated to a union convention that the Teamsters are preparing a nationwide drive in aircraft plants Teamsters already are contesting with IAM and UAW for workers at Rohr Aircraft Co, Chula Vista, Calif.)

▶**Employment Gains**—Neither Boeing nor Ryan (where company and union are deadlocked) are waiting for official efforts to end the strike Both have launched aggressive re-hiring campaigns Both are using newspaper advertisements with some success After four weeks of the strike at Ryan, re-hirings as a result of the ads were better than 100 a day

Boeing is combining ads with more sweeping measures. It has sent out teams of workers to a number of northwest cities to sign up workers for the Seattle plant, and is asking present employes to recruit friends.

In addition, the company has announced that subcontracting and increased worker efficiency will cut the number usually employed by about 5000. This would mean the pre-strike employment would be reduced to around 14,000 Present employment is above 7000.

▶**Bendix Turnabout** — The Bendix strike ended more quickly than was expected. The Detroit and South Bend locals approved the agreement to extend the former contract from June 26 to July 18 and accepted the proffered 13½ cents an hour wage boost during the interim (AVIATION WEEK, July 5) Work resumed last Monday

But the Bendix situation is not entirely settled The locals merely have agreed to the terms for the period ending July 18. Last week negotiations started again. Bendix' job is to persuade the locals to agree to the interim terms as the basis for a new contract If the company fails, more trouble may be in store

Production Progress Report

AIRCRAFT Month	Personal Type Nos.	Personal Type Value	Transport Type Nos.	Transport Type Value	Military Nos.	Military Nos.	Total Value*
January	468	$2 055 755	13	$2 488 533	148	611	$9 326 577
February	453	2 148 200	14	2 994 084	155	622	10 188 587
March	571	2 822 326	14	5 196 991	278	863	12 490 038
April	736	3 022 488	19	5 401 869	165	937	13 540 760
Total	2238	$9 778 736	57	$15 080 477	738	3033	$45 046 092

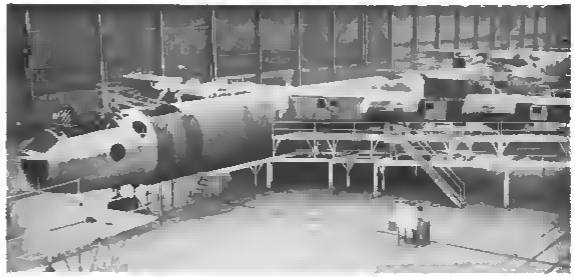
ENGINES Month	Civil Nos.	Civil Value	Military Nos	Military Value**	Total Nos	Total Values***
January	779	$4 721 385	287	$18 885 879	1066	$23 675 022
February	1007	5 360 545	385	20 504 214	1392	25 958 747
March	1093	5 174 775	379	24 803 251	1473	30 157 553
April	975	5 234 781	416	28 901 422	1391	31 121 882
Total	3854	$20 511 565	1437	$93 885 266	5291	$110 914 104

* *Does not include value of military shipments, but includes aircraft parts and conversions*
** *Value represents all shipments from military during month whether or not for engines delivered, and includes parts*
Figures based on "Facts for Industry," Bureau of the Census

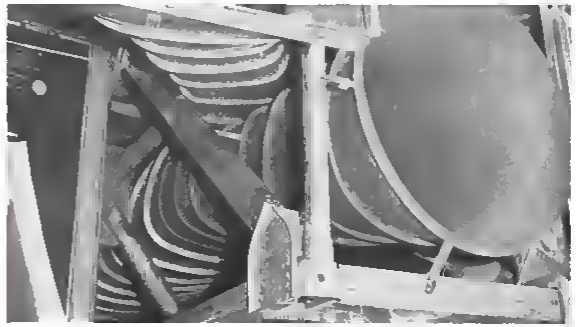
PERSONAL AIRCRAFT

Company	May Nos.	May Value	Jan Nos	Jan-May Value
Aeronca	91	$278 000	340	$938 000
Beech	58	433 000	319	2 451 000
Bellanca	5	25 000	18	90 000
Cessna	140	558 000	590	2 348 000
Erco & Ken	18	50 000	52	153 000
Fairchild	7	23 000	35	144 000
Luscombe	68	188 000	281	776 000
Piper	218	860 000	599	1 145 000
Republic	1	5 000	11	43 000
Ryan	54	354 000	208	1 387 000
Stinson	58	440 000	497	2 291 000
Taylorcraft	2	5 000	27	40 000
Twin Engineering	21	37 000	115	354 000
Total	772	$2 812 000	3388	$11 896 000

Figures as reported to Aircraft Industries Association



Applications of magnesium skin on B-36 fuselage and leading edge are shown by dark areas.



Magnesium air duct installations.

Magnesium As Weight Saver

Valuable lessons learned in utilizing lightweight alloy as production material for various parts of B-36.

Prompted by the vital consideration of weight-saving, Consolidated Vultee has designed 8000 lb of magnesium alloy into the structure of its long range B-36 bomber.

Utilization of four tons of this lightweight metal (exclusive of Government-furnished magnesium items) amounts to approximately 10 percent of the airframe weight, and is estimated to have saved approximately 1900 lb in the plane's weight empty—extending the range by 190 mi.

▶**Magnesium Applications**—Most important applications include:

- Plating for approximately half the fuselage.
- Wing and control surface leading edges, including both inner and outer skins for the anti-icing system.
- Covering for trailing edge.
- Most castings in the plane.
- Miscellaneous formers and air ducts.
- Numerous minor installations.

▶**Fuselage Details**—Central portion of the fuselage, in the bomb bay region, has low stresses in the skin. It was desired to use as large a stiffener spacing as possible, avoiding the formation of shear wrinkles under normal unaccelerated flight conditions.

For this application, magnesium alloy is considered ideal because its greater bulk factor gives local stiffness with weight saving. Skin gages from .032 to .051 are used.

In the aft portion of the fuselage, skin stresses are sufficiently high, and design is dictated by tension stresses rather than by stiffness. Since magnesium alloy compares unfavorably with high strength aluminum alloy on a tension-weight basis, the latter material is used here.

▶**Leading Edge, Anti-Icing Use**—Leading edge coverings of wing and control surfaces are also subjected to low stresses—.025 to .040 magnesium alloy skin being used. Inner dimpled skin serving to direct flow of the heated anti-icing air is .016 annealed alloy.

Studies indicate that at the maximum temperature of 150 F. which may be reached in flight with the anti-icing system in operation, physical properties of the outer skin will not be reduced below values adequate for strength requirements.

▶**In Trailing Edge**—Entire wing trailing edge and some portions of the fixed control surfaces are covered with .016 magnesium alloy skin, with wide rib spacing. To stiffen this skin and avoid deformation or fatigue cracking, a somewhat complicated formed section—waffle—is attached with a metal adhesive—Convair's Metlbond, similar to Chrysler's Cycleweld.

Attachment of this stiffener to the skin with a metal adhesive not only breaks the area into small sections, but gives continuous attachment at all flanges, thus avoiding stress concentrations which would otherwise occur in riveting or spotwelding.

Fatigue tests made on these assemblies indicate that life will be several times that of similar assemblies made up by riveting or spotwelding. It would probably not be feasible to use such thin outer skin with any other method of attachment.

Originally, attempts were made to form these stiffening sections from .016 aluminum alloy. This did not prove feasible because of cracking during forming and sound parts obtained were not flat. Fabrication of these parts (sub-contracted to Dow Chemical Co.) were made from .025 magnesium alloy, having approximately the same weight as the .016 aluminum used originally.

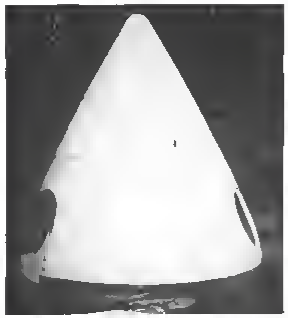
▶**Control Surface Considerations**—Use of .016 magnesium alloy skin and formed stiffeners attached with metal adhesive is being considered for use in covering trailing edges of movable control surfaces.

No metal covering for these parts has been found which will be as light as the present fabric covered assembly, but nearest approach thus far is with the type of construction previously described. If other versions of the B-36 should have higher speed, this change will probably be made to avoid fabric ballooning.

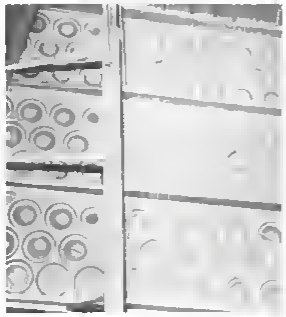
▶**About Castings, Formers**—Applications of magnesium alloy castings include control system drums and bell cranks and numerous fittings throughout the plane.

Very few castings of any type are used for control surface hinge supports because it is felt that hidden flaws could result in fatigue failure.

Magnesium alloy castings have strength properties approaching those



Magnesium propeller spinner



Trailing edge waffle construction

Magnesium bomb bay door.

of aluminum alloy. Also, in casting design, section thicknesses are frequently determined by the minimum thickness which can be cast, rather than by strength considerations. Hence, the volume of a magnesium alloy casting is frequently little greater than that of aluminum alloy for the same purpose, and weight can be saved almost in proportion to specific weights of the two materials.

Use of magnesium alloy for formers is somewhat doubtful. These are more expensive and difficult to form because of heating required. Unless stresses are very low, so that thicknesses are determined by local stiffness, high strength aluminum alloy is likely to be more economical. Hence, few such parts are used.

▶**Ducting Use**—Many magnesium alloy welded air ducts are used. Most carry cold air or, if not, are approximately circular in shape. If used at elevated temperature—particularly in a non-circular cross section or with negative internal pressure—the yield point of the magnesium may be reduced to a point where better weight-stiffness ratio can be obtained with aluminum, relatively unaffected by temperatures ordinarily encountered.

One difficulty in ducting-use for magnesium alloy stems from the condition that most gasket materials normally used in bolted connections absorb moisture, or themselves cause corrosion of the flange faces. None of the vegetable fiber type gaskets has been discovered which is satisfactory in this respect.

Synthetic or silicone rubber is used in some applications, but the cold flow of these materials may cause them to squeeze out of the bolted flanges. Asbestos or Fibreglas are occasionally used in combination with these materials, but they are not always pressure tight.

Much weight can be saved in equipment items, such as cases for electrical devices by the use of the alloy, and many such applications are used on the B-36.

It has been found, however, that difficulty frequently results when vendors are not familiar with protection methods to avoid corrosion resulting from moisture or contact of dissimilar metals.

▶**Magnesium to Aluminum** – There have been changes from magnesium to aluminum in minor applications in the B-36.

In some instances, this resulted from poor detail design or attempts to use thicknesses which proved inadequate. In other cases, before the shop became familiar with forming and welding techniques, changes to aluminum alloy were made to avoid fabrication difficulties which seemed hopeless at the time.

When failures from fatigue or other causes occur, the quickest fix is to substitute aluminum alloy, possibly of the same gage, because tooling required is less complicated and experience with aluminum alloy leads to greater trust in the material.

Thus, changes from magnesium to aluminum have been made in many cases because time was not available to find the correct solution in magnesium.

▶**Processing Data**—Most of the applications of exterior magnesium alloy skin are made with flush type rivets. An electrically heated tool is used to dimple all sheet. Temperatures vary between 450 and 600 F, and dimpling time varies between 1 and 5 sec. In general, large rivets and thick sheets require more heat than do small rivets and thin sheets.

Tests of flush riveted joints have proved that these high temperatures do not anneal the sheet sufficiently to reduce joint efficiency, because of the short time of application.

Equipment with automatic temperature and time control units was not available commercially, and controls of this type to be used with a commercial riveting press were developed and used satisfactorily. Little trouble is experienced so long as equipment is kept in proper adjustment.

Sheet is anodized and primed prior to dimpling, and damaged areas of the primer touched up prior to riveting. Ordinarily, no touching up is required.

Both arc and gas welding processes are used, with welding confined to M1 type alloy for simplification and to avoid the necessity of stress relieving. (High frequency welding equipment has not as yet been used but is being obtained.)

In the hot forming of hard rolled material, temperatures are normally confined to 300 F. for AZ31 and to 400 F. for M1. However, higher temperatures for limited times are permitted. Heats of 400 and 500 F., respectively, are permitted for these two alloys if total time at temperature does not exceed 3 min.

Strength values slightly lower than specification minimums are used in the design of hot formed parts.

Controlled heating equipment is expensive and difficult to use when only a small percentage of the parts being fabricated is magnesium. A compromise often followed is to heat tools in an oven and use them until they cool, after which they are re-heated. However, many parts are being formed successfully in drop hammer when quantities are small, and with draw dies when quantities are larger.

An anodizing process suitable for magnesium alloy was developed by Convair and is used instead of a chemical treatment for most of the B-36 parts. This gives a finish harder than that obtained with chemical treatments and of higher electrical resistance. After being covered with a thin coat of zinc chromate primer, it resists corrosion better than a chemically treated part finished in the same manner. However, the use of anodized material without some type of organic sealing is not recommended. In addition to better

protection, this process is believed to be cheaper when cost of chemicals is considered

►**Lessons Learned**—From the use of magnesium in the B-36, certain conclusions have been reached as to the applicability of this material to military craft. Most of the light alloy castings in any type of aircraft can probably be made economically from magnesium alloy. Large margins are needed in lugs and at bolt holes.

In heavy bombers, where weight is of utmost importance, the alloy should be used for all applications where it results in weight saving. A rough estimate would indicate that 10 percent of the airframe weight might be magnesium alloy.

When extremely heavy skin is used to obtain super smoothness in high speed craft, a monocoque type of construction will be approached. If magnesium alloy, rather than some of the sandwich types of construction now under development, is used for covering, this may account for 50 percent of wing weight and 25 percent of fuselage weight.

Because of high material and fabrication costs, it is not thought that magnesium alloy will be economical for large quantity use in trainers, troop carriers, or cargo craft. However, it may be used in such applications for other reasons. The material is less strategic than other structural materials.

Magnesium alloy can be used satisfactorily in almost any application where temperatures and other ambient conditions are suitable. But thickness should not be reduced to a point where stiffness of unsupported flanges is lost.

If extremely thin sheet is used, it must be supported continuously by methods similar to those of the trailing edge of the B-36, where stiffening members are attached with a metal adhesive.

Most efficient use of the metal occurs in those cases where local skin stiffness is important. It can be used with little increase in expense if applications are confined to locations where it is flat or has only single curvature.

If a shop is sufficiently well equipped and versed in hot forming techniques, magnesium alloy can be used economically for formed parts because of its excellent formability when handled under controlled conditions.

However, in a shop which is organized and trained primarily in the fabrication of aluminum alloy, the hot forming of magnesium leads to additional expense and fabrication difficulties.

So long as magnesium formed parts constitute a small percentage of those being fabricated in a shop, its use will be expensive.

Probably magnesium alloy welded fittings would be an economical substitute for forgings and castings where small quantities are involved, but experience with this type of part is somewhat lacking, and few designers have sufficient confidence in welded magnesium assemblies to trust them in important applications.

►**Slant for Industry**—It is felt that in recommending magnesium alloy and fabrication methods to airplane manufacturers, the magnesium industry should remember that it probably will not be fabricated in a shop highly trained and equipped for the use of magnesium, but will be worked by the same people and with the same equipment used for aluminum.

Thus, simplest possible control methods are needed. If possible, it is desirable to have only one general purpose alloy. If more than one alloy is required, fabricating temperatures should be the same for both.

The ideal alloy will be tough, formable and weldable. It will not require stress relieving after welding, because this is an item easily forgotten, particularly when parts require local repairs after completion. Materials susceptible to stress corrosion cracks after a few weeks, because of some minor error in processing, are not considered satisfactory.

If the present M1 alloy had higher strength, it would have much to recommend it for economical usage. It can be welded easily without later stress relieving operations, and appears to be about as formable as any of the other alloys.

One difficulty in having two or more alloys of magnesium in the shop is that they get mixed. The right process may be used on the wrong material.

Some of the prejudice against the use of magnesium can be overcome if processing can be kept simple so that mistakes are difficult to make. Most of the people who will work with magnesium are not magnesium experts, and probably will not be for a long time.

(The foregoing material is based on a paper presented this Spring at the Fourth Annual Meeting of the Magnesium Association, in New York.)

Boeing Taps Colleges

About 100 students have already accepted jobs at Boeing Aircraft Co., and an additional 150 are expected, as part of Boeing's year-old program of enlisting college seniors for company engineering jobs.

Over 758 students have been approached by 19 Boeing engineers making personnel interview tours of 14 leading engineering colleges. Students at 70 other schools were contacted by mail.

Research Review on

Raising Turbine Inlet Temperature

Power increase to be gained in jet engines by boosting permissible temperature calls for blade cooling.

By Robert McLarren

Most promising avenue of improving the power and economy of the gas turbine engine lies in increasing the temperature of the gases at the turbine inlet, since for a given capacity of air flow, power per pound of air developed is proportional to the inlet temperature.

Thus, raising the turbine inlet temperature from 1500 to 2000 deg F would increase the engine's specific thrust 32 percent and could reduce the weight of the power plant approximately 30 percent.

▶**Means for Temperature Rise**—Three principle approaches of permitting this turbine inlet temperature increase are now undergoing intensive study. These are through use of:

- 1. Heat-resistant metal alloys.
- 2. Ceramic materials.
- 3. Turbine cooling.

Although the alloys offer most long-term promise, there are present indications that progress in this field will require many years of concentrated effort. Already apparent is the necessity of special fabricating techniques requiring careful control of processes.[1]

Evident, too, is the growing problem of thermal shock resistance arising from the wide difference of properties of these materials at room temperature and at the elevated temperatures of turbine operation.[2]

The good thermal resistance properties of various ceramics have placed them in the forefront of development, with certain porcelains already showing a tensile strength of over 15,000 psi at 1800 F and over 10,000 psi at 1900 F.

However, thermal shock is an even more serious consideration in ceramics than with alloys, and the short life of ceramics already tested indicates a broad field of problems with this material.[3]

▶**Cooling Indicates Solution**—Most immediate promising avenue of development appears to be with turbine cooling.

One of the first considerations, however, is a thorough understanding of temperature distribution in turbine disks and effect on elastic properties.

The disks are normally operated at such high temperatures that the materials used are at a perilously low strength. For example, the Air Force limits its jet fighters to a maximum turbine overspeed of only 1.5 percent over rated engine speed. This is an extremely slim margin of safety but is considered necessary for maximum performance.

▶**Cooling Factors**—The hot gases impinge on the turbine blades and the temperature progresses to the rim and thence into the turbine disk.

Cooling of the disk at the center produces steep temperature gradients creating high thermal stresses.

Rim cooling offers little promise because of low thermal conductivity of the materials used. Tests indicate that rim cooling permits an increase of only 200 F. Though providing a significant gain in turbine output, this is far short of providing the 3000-3500 F desired.

Blade cooling, then, offers the most practical immediate solution and three methods are being investigated.

▶**Hollow Blade Air Cooling**—This consists simply of providing a flow of air through the hollow turbine blade, the heat flowing from the hot gases through the blade's thin metal surface and into the cooling air.

Tests of this system indicated that a temperature increase of about 500 F is permissible, also, that the Mach number of cooling air is important.

When Mach 1.0 occurs in the blade passage, choking is produced, permitting no further cooling action. By limiting the cooling air Mach number to 0.6 and using a cooling air flow of about 13 percent of the hot gas flow, satisfactory operation at an increment of 500 F was obtained.

These tests showed that only that portion of the cooling air immediately adjacent to the blade surface was effective as a coolant, and the interior passage was redesigned with an insert within the blade that forced the air to circulate next to the blade interior only, similar to the action of a cylinder baffle on a reciprocating engine.

Tests of blades containing such an insert increased the effective gas temperature 600 F and reduced the amount of air flow required from 13 to only 4 percent of hot gas flow.

By holding the coolant air Mach number to unity and utilizing the blade insert, gas temperatures up to 2300 F at the turbine inlet now appear permissible.

▶**Liquid Cooling**—This method poses problems considerably more complex than a system using air insofar as the liquid system must be closed to prevent fluid loss.

Quantities of fluid required for an open liquid system are so high that supply would pose a problem similar to that of engine fuel.

Because a closed system is required in which fluid flows radially to the blade tip, it must be pumped back down the blade against the centrifugal force of the spinning turbine, requiring extremely high pressure pumping.

A typical liquid cooled blade has two round passages running within the blade for circulating liquid out to the tip and back. A study of this blade disclosed that whereas the region adjacent to the coolant flow was at a nominal 350 F, regions near the blade trailing edge ran as high as 1100 F.

Theoretical studies indicate, however, that if the liquid passage can be placed as close as ¼ in. to the trailing edge, sufficient cooling can be obtained to permit operation of the blades at turbine inlets as high as 3000 F.

Another solution is the use of ceramic coating on water-cooled blades. Tests of a blade with 0.010-in. ceramic coating provided an increment of about 450 F in permissible temperature over that of the water-cooled blade alone.

▶**Sweat Cooling**—Here, the part to be cooled is fabricated of a porous material through which coolant is forced under pressure. In this method, the temperature of the coolant, which moves in a direction opposite to that of the heat flow, increases gradually while passing through the porous material. After passage through the wall pores, the coolant forms a protective layer on the surface exposed to gases.

Tests with this method, using water as the coolant, showed that there is a critical value in the amount of flow. Above this flow the surface temperature of the porous material remains near or below the boiling point of water. With decreasing flow from this value, surface temperature increases very rapidly.[4]

On the other hand, tests with gas used as the coolant indicated that increase in the quantity of coolant provided increased cooling, since the gas does not undergo any change of phase.

Through a process developed by the California Institute of Technology, copper, nickel, and stainless steel were sintered via powder metallurgy to achieve desired porosity. Cylinders of these materials were then exposed to a 4200-F oxygen-hydrogen burner at a flow velocity of 300 fps. Gaseous hydrogen and nitrogen were used as coolants, and tests indicated that the required rate of nitrogen flow was approximately five times that of hydrogen.

A hydrogen flow of only 0.00025 lb./sq. in. sec. reduced the surface temperature of the copper liner to 400 F, and the nickel and stainless steel liners to 225 F.

While the oxygen-hydrogen flame simulates a rocket chamber, experiments with a gasoline-air burner, simulating a gas turbine condition at a temperature

of 1900 F indicated that a nitrogen flow of 0.0016 lb./sq. in. sec at a velocity of 915 fps lowered the surface temperature to about 440 F.

▶**Disk Design Details**—An integral part of turbine cooling is the proper design of the turbine disk since the critical section of the turbine blade occurs close to the root portion.

One important consideration is temperature distribution across the disk. Severe gradients cause thermal stresses of sufficient magnitude to reduce disk operating safety, and small temperature gradients yield thermal stresses that actually can reduce the centrifugal stresses in the rim.[1]

Although all centrifugal stresses are tensile, thermal tangential stress actually produces compressive values which reduce the rim margin of safety. Excessive compression stresses often cause plastic flow of the rim during engine operation, and when the disk cools a system of tensile stresses is set up that can cause rim cracking.

Thermal and centrifugal stresses are both tensile at the center, hence should these stresses become excessive a sudden rupture of the rotor usually occurs. To prevent this, current gas turbine rotors usually have a larger margin of safety at center than at rim.

▶**Temperature Distribution Considered**—Through proper design, fairly minor changes in disk temperature distribution can move the maximum stress away from the critical region of the rim. The radial temperature distribution in a turbine disk may be expressed:

$$T = ar^n + b$$

in which T is the temperature at radius r, and a, b and n are constants determined by the assumed temperature distribution.

Margin of safety at the disk center increases as n is increased but, since the temperature gradients also increase with n, the margin of safety of the rim is reduced.

Reducing the thermal stresses decreases the equivalent tensile stresses as the temperature of the disk center is increased, but the stress at the rim is increased in the very same process.

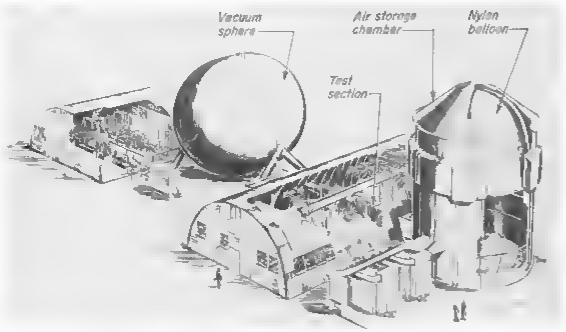
The tangential centrifugal and thermal stresses are of opposite sign and for a temperature distribution corresponding to a center temperature of 1200 F, for example, there is no thermal stress to reduce the effect of the centrifugal stress, therefore, the equivalent tensile stress at the rim for a center temperature of 1000 F is lower than that for a center temperature of 1200 F.

Lowering the center temperature increases the material strength at the center and thereby increases the margin of safety. This indicates that the margin of safety at any point in the turbine disk is affected not only by the thermal stress produced by temperature distribution but also by the temperature effects on the strength of the material.

Temperature distribution may be changed by relocating the seal between the cooling air and the hot gases, and by altering the supply of cooling air, both of which would shift the stress peak away from the rim, thereby reducing the local stress in the blade attachments.

Although centrifugal stresses are only slightly affected by changes in the relation between modulus of elasticity and temperature, thermal stresses are approximately proportional to the coefficient of expansion and the modulus of elasticity.

Because the effects of thermal stresses are likely to predominate, desire is for modulus of elasticity and coefficient of heat expansion to be small.



Balloon Operates Wind Tunnel

Now being erected, North American Aviation's supersonic tunnel—for testing rocket and plane models at speeds up to 3400 mph.—will be operated by dry air from a 22,500 cu. ft. Nylon "balloon."

A cup-shaped rubber impregnated diaphragm, the balloon measures 34 ft. in diameter, is 20 ft. high, and will receive outside air dried by pumping through silica gel beds.

Complementary equipment will be a 38-ft. steel vacuum sphere which will be evacuated as the air chamber is filled.

During runs, air will rush from the storage balloon through the 16×16 in. test section and into the vacuum chamber, which has a capacity of 36,000 cu. ft. Air will be drawn from the balloon at maximum rate of 65,000 cfm.

Because of the difference in volume of dry air available for test and capacity of the vacuum sphere, a 4×5 ft. relief door will allow outside air to enter the balloon when all dry air is expended.

To compensate for the short interval of time before the relief door opens, a 28 ft. flexible diaphragm, 3 ft. deep and holding 2000 cu. ft. of air will be located in the bottom of the storage chamber. When all dry air is expended from the balloon, air will be supplied from this smaller diaphragm before the relief door opens.

The balloon technique for storing dry air is considered novel in the aircraft industry. A similar scheme, tried by an eastern university, utilized surplus barrage balloons for storage and tank cars as vacuum chambers.

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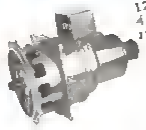
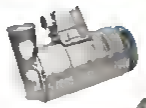
AIRCRAFT MOTORS AND GENERATORS

Wing Flap Actuator, 12 v, d-c—1/50 hp inverm., 10 rpm.



Constant-Frequency Alternator, 40 kva, 120/208 v., .75 P.F., 400 cycles, 6,000 rpm.



Variable Speed D-C Generator, 30 v., 9 kw, 30 v, d-c, 300 amps, 3,000/9,000 rpm.

Constant-Speed D-C Generator, 24 kw, 30 v, d c, 800 amps, 6,000 rpm.

Centrifugal-Type Blower Motor 27 v, d c, 55 hp cont., 7,500 rpm.

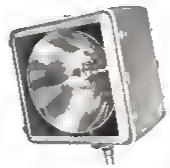
Hydraulic Pump Motor 208 v, 400 cycles, 3-phase, 7.5 hp cont., 11,500 rpm.

There's a drive for every flying job—and a generator to supply the power—in the complete line of Westinghouse motors and generators. Built to exacting specifications—and tested under actual flight conditions—these units give you the proper combination of dependable performance and minimum weight. The units pictured are just a few to indicate the range of application, the speeds, frequencies and power available in both motors and generators.

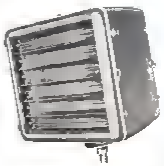
ALL-WEATHER AIRPORT LIGHTING

Here's another Westinghouse development designed to remove the hazards imposed on aircraft by "ceiling zero" conditions. This approach lighting system is visible through 1,000 feet of the thickest weather—when objects 50 feet away cannot be seen. It's the long-awaited landing aid that takes up where radio direction ends. Its principal units are shown below.

High-intensity Runway Light ... a new light designed to provide better runway indication under any visibility condition. It contains 3 separate light sources, one medium-intensity and two high-intensity, independently controlled, with ten steps of brightness.



Flash Unit ... employs a Krypton lamp having a maximum brightness of over 9 million candlepower per square inch. This is magnified by the optical system to give the unit a candlepower range of 1,000,000 to over 3,000,000,000.



Blaze Unit ... contains 6 straight, stroboscopic-type tubes with an effective length of about 2 feet. Steady burning brightnesses range from 100 to 10,000 candlepower and flashing brightnesses from 100,000 to 10,000,000 candlepower.

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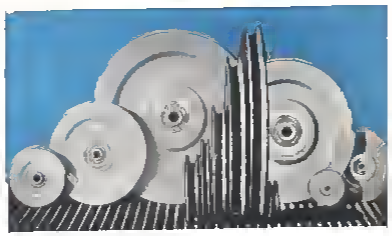


Micarta Aircraft Pulleys

A natural for aircraft duty, Micarta pulleys provide real dependability in the vital function of cable control. Their use on all types of aircraft has long been approved by the Army, Navy and CAA. Lightweight and tough, Micarta pulleys cause practically no wear on the cable, with a minimum of wear on themselves, thus assuring long life for both cable and pulley. They are available in a wide range of standardized sizes for every type of cable control from engine to rudder.

Battery Chargers

Rectox mobile battery chargers are available for outdoor use on 115/230-volt circuits for charging 6 or 12-cell airplane batteries. The units are self-regulating and self-protecting. Adjustment of charging rate is simple.

Engine Starters

Completely self contained in a weather-proof steel cabinet, the Rectox engine starter is wheel-mounted for easy portability. It delivers full output voltage instantaneously and maintains high efficiency over a wide load range.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Leader in Aviation Equipment

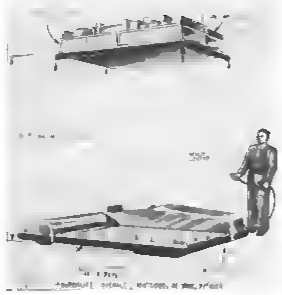
AIRBORNE

ON THE GROUND

NEW AVIATION PRODUCTS

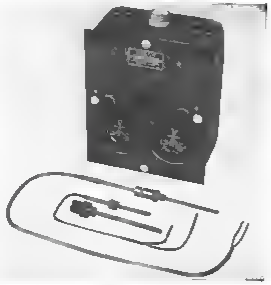
Die Filer

Tool and die makers will be interested in bench filer, Model 1500-S, marketed by **DoAll Co.**, 254 N Laurel Ave., Des Plaines, Ill. Stepless speeds from 170-470 strokes per min. are claimed for filing, sawing, or honing, in range of materials. Two power magnifier is equipped with twin lamps for exacting work. Also included are universal joint file clamp, vertical slide bearings, air jet chip removal, screw operated tilting table with register pin for 90 deg., splash oiling, and spring-loaded upper tool clamp. Table is 10¾ in. square, stroke is 1½ in.



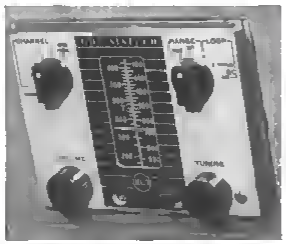
Facilitates Cargo Handling

To aid in cargo movement to airplane deck, new materials handling truck, "Superlift" features loading platform 8 in. above ground, rising on telescoping hydraulic arms to maximum height of 10 ft. 5 in. Unit has been developed by **Rhodes Lewis Co.**, 4008 West Jefferson Blvd., Los Angeles 16, Calif., under U.S.A.F. experimental contract. In side loading of aircraft, platform is hoisted to plane's deck level and hydraulically tilted 1½ deg. to permit cargo to slide into freight cabin entrance. Electric remote control pushbutton box permits operator to be absent from driver's seat in positioning hoist platform.



Temperature Indicator

Model 183 indicating and alarm system offered by **Instrument Div., Thomas A. Edison, Inc.**, West Orange, N. J., is designed to furnish simultaneous remote indication of temperature at three locations in each of two aircraft power plants, and give visual and audible alarm if predetermined value is exceeded. Power is from any 28v. d.c. source. Bearing temperature is measured by tip-sensitive type bulb with tip pressed firmly against bottom of bearing support well by spring in bulb holder. Oil temperature is measured with stem-sensitive bulb installed in oil bath. Three scales of each indicator show temperature at three bulb locations in one engine. Each alarm light calls attention to excessive temperature reading on associated indicator. Test switch provides means of simulating overheated condition of known temperature at any of three bulb locations in both engines. Audible alarm device (not supplied by manufacturer) varies with installation involved.

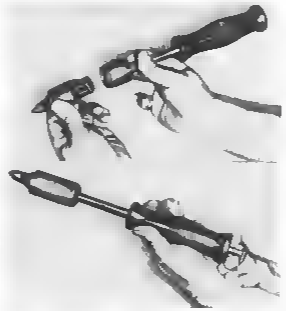


Lightplane Transceiver

Compact, lightplane radio transmitter-receiver, "One Sixteen," provides communication and navigation facilities in single unit. Maker is **Radio Corp. of America, Engineering Products Dept.**, Camden, N.J. Unit weighs 9 lb. and fits into instrument panel. Single selector switch makes it possible to shift to tower communications, four course ranges, marker beacons, standard broadcast frequencies, loop direction finding, six VHF transmitting channels, cabin intercommunication system, and loudspeaker operation, with speaker switch on front panel for shifting to carphone operation. Included is VHF whip antenna, brackets, and cables.

Nylon Strip

New Nylon formulation, FE-1044, available in strip form, for use as seating disks for low pressure valves and gaskets which must remain flexible, is offered by **Polymer Corp.**, Reading, Pa. Material is described as having characteristics of rubber and resistance to hydrocarbons. Claimed is that it is applicable to problems where oil or gasoline is involved.



Self-Heating Solderer

Requiring no electric current or external heat, new "Quik-Shot" soldering iron utilizes chemical cartridge stated to heat iron to working temperature and maintain high heat for 8-10 min. Placed in copper tip of unit, cartridge contains primer and is ignited in bullet fashion. Wattage rating is 50-200w. Maker is **Kemode Mfg. Co.**, 2 W. 46 St., N.Y.C.

Cargo Conveyor

Developed for air freight operators is electric-poweted conveyor designed to move palletized loads into position on aluminum skids on floor of cargo plane. Maker is **Trusty Air Cargo Conveyor Co.**, Los Angeles, Calif. System consists of reducing gear device, continuous chain running in special dural tracks mounted flush in airplane floor, and lugs engaging with driving chain. Lug can tow or push cargo pallet, or pull cable via block and tackle to haul pallet up ramp from ground to plane deck.

AVIATION WORLD NEWS

SAAB-20, now awaiting flight tests, shown in construction.

Sweden Develops Jet Aircraft

Fitted out as a "flying lab," pressurized fighter is scheduled to begin test flights this summer.

Sweden's contribution to jet craft development is typified in the Saab-29 (R 1001) pressurized fighter, designed for over-625 mph. speed with a de Havilland Ghost powerplant developing 4840 lb. thrust.

First test flights are scheduled for this summer, following extensive ground checks.

General configuration of the fuselage shows a marked similarity to that of the Mikoyan jet fighter, a secret Soviet craft recently revealed by AVIATION WEEK (June 14, 1948). Both have the aft fuselage portion bellied beneath the boom.

On the 29, the shape of the rear fuselage section is partly to obviate the undesirable extension of the jet pipe partly to allow the fuselage-contained alighting gear to be placed as low as possible without grounding the tail on landing.

► **Preliminary Checks**—Projection of the Saab-29 design was begun about 2½ years ago—at a time when little information on very high speed was available in Sweden. Accordingly, concurrent with the design phase a comprehensive research and testing program was carried out, including wind tunnel tests more far-reaching than any afforded to Saab's earlier types.

This investigation was supplemented by practical flight tests to half-scale. For this purpose, a Saab Safir was fitted with a wing structure having the same form as the 29.

For ground testing, a complete hull was built simultaneously with the first test plane, and subjected to the same loads calculated for the 29 to withstand in air.

Stresses were checked at some 700 points, and the hull was finally loaded to destruction.

► **Wing, Cabin Details**—The full fuselage is complemented by a thin swept-back wing, which is constructed as a continuous, rigid and smooth 75S shell. Outer part of the wing tip has been fitted with automatic slots to allow satisfactory control of the plane even after the stalling angle has been reached.

The stabilizer, which has a variable angle of adjustment, has been placed high to eliminate disturbances from the wing at maximum speed.

Top of cabin is designed to be shot away by explosive charge, and pilot's catapult seat will throw him 50 ft. in the air to clear the tail at high speeds.

Schedule for the test flights provides for risks to be taken only gradually. The plane will assume the role of a flying lab to gather numerous readings—pressures, temperatures, and stresses—by special instrumentation, to determine how actual results check with calculations.

New French Turbojet

PARIS—A production order for nine prototypes of the new turbojet, TGAR-1008, has been received by the Le Bourget factory of the Compagnie Electro-Mecanique.

Full information on the new engine is lacking so far, but it officially is stated to be designed for regular use of 6400 rpm. with 4200 lb. thrust, and a maximum of 6700 rpm. with 5075 lb. thrust.

During an initial two-hour test run, the engine operated at 5550 rpm. and developed a 3300 lb. thrust.

New Services

Aer Lingus reopened its Dublin-Isle of Man service using DC-3s. There will be three flights weekly. Constellations were withdrawn from the Dublin-London route and were replaced by DC-3s. Ten flights are scheduled daily. Dublin-Brussels operations were suspended.

KLM, Royal Dutch Airlines, resumed Holland-Greece service using DC-4s on its twice-weekly run. Passengers from Greece now have direct air link with the Far East (via Cairo), Western Europe (via Rome), and the Americas (via Amsterdam and New York). KLM is using DC-6s on its Holland-Latin America route.

Panair do Brasil has inaugurated Rio-Madrid Constellation service, leaving the Brazilian capital twice weekly.

Sabena, Belgian Airlines, is operating once weekly from Johannesburg to Brussels in 24 hr.—first time South Africa has been within a day of Europe.

Skyways, Ltd., has been permitted to operate direct air service between Johannesburg, Madagascar, and Mauritius.

Trans-Canada Air Lines is scheduled to make two flights daily in each direction between Britain and Canada.

India Still Buys British

BOMBAY—British aircraft continue to get an official nod in India, recent sales reports show.

Latest purchases include a custom-fitted Vickers Viking for Pakistan's Governor-General Jinnah, a de Havilland Dove for high officials of Pakistan's Sind province and another Dove for officials of India's Madras province.

Cost figures have been revealed only in the case of Madras, where the delivered price is quoted at roughly $100,000 in an official statement.

LETTERS

Inter City's Rates

To the Editor

This is in answer to the letter from John Van Arsdale recently published in your magazine. I assume that inasmuch as you printed his letter you are in complete agreement with its contents and, therefore, will tell me how Inter City Aviation, Inc., can charge less than $4.00 for storage. For your information, some time ago I wrote Mr. Van Arsdale and asked him to show me how this could be done and so far he has been unable to give me an answer. Added to this, he has paid nothing for his night's storage.

His letter which you have seen fit to print makes Inter City Aviation look like profiteers at the expense of the airplane owner. This is not so and to prove it, I will take the liberty of quoting some of our flat maintenance prices.

1 Major overhaul 4 cylinder opposed 65 hp class—$100.00. Includes all accessories.

2 Jacobs L4MB and other engines in this class—$450.00. Includes all accessories.

3 Complete overhaul 4 cylinder magneto—$9.50.

4 Complete overhaul NAS series carburetors—$7.50.

5 Magnaflux 4 cylinder opposed engine—$7.50.

I believe you will find the above prices, in most cases, cheaper or as cheap as any work done anywhere in the country and, even if I do say so, when our mechanics overhaul an engine it really runs. We carry a comprehensive line of aviation parts and accessories and I am sure that a check anywhere in New England will assure you that our prices are as low or lower than those of our competitors.

I feel our storage charges must be governed by the cost of our hangar; however, I shall await with great interest your advice as to how we can charge the so-called $2.00 rate. Please let me hear from you immediately as there is nothing Inter City Aviation would rather do than lower their rates.

E. Mauran Beals, Jr.
Inter City Aviation, Inc.
East Boston 28, Mass.

Justice for Capt. Davidson

To the Editor

On behalf of the American Airlines pilots based in Boston, and I feel safe in saying all airline pilots I want to thank you most sincerely for your fine editorial tribute to the late Capt. W. A. Davidson and crew of the ill-fated Alpha.

It is highly commendable to see the editor of the nation's leading aviation weekly devote his entire editorial page to further right the terrible injustice done these men by ... District Attorney C. P. Sullivan, and the jour-listically yellow Long Island Star-Journal.

"Reply to a Politician's Smear" brings to a belated, dignified conclusion the last flight of an excellent pilot and gentleman.

Sheldon E. Pangburn
ALPA Chairman, LC-6
Boston, Mass.

I have just returned from a trip on the system and find your article on the CAB exoneration of our Alpha pilot and want to thank you for the forthrightness of the statement.

We felt that the Queens County D. A. was way off base and now that the CAB has agreed with us after a complete investigation, including a lot of material which the D. A. and Queens County Grand jury refused to hear, we are very happy that an impartial juror of recognized stature like yourself said what you said.

R. S. Damon, President
American Airlines
New York, N. Y.

Just concluded your editorial of May 24, 1948, dealing with "Reply to a Politician's Smear."

Your editorial ... a fine tribute to the reputation of the pilot in question. ... Constructive editorials of this type will certainly contribute to the advancement and understanding of aviation by the public.

Jay Abbott, Press Office
K.L.M. Royal Dutch Airlines
New York, N. Y.

Congratulations on the ... thorough job on the Davidson-Sullivan case. It did my heart good to see the way you threaded the case history, the histrionics and the facts together.

Aubrey O. Cookman, Jr.
Aviation Editor
Popular Mechanics Magazine
Chicago, Ill.

Please accept the heartfelt thanks of myself and Mrs. Davidson for the splendid article in defense of our son, Captain W. A. Davidson.

James Davidson, Sr.
Christina M. Davidson
Palmyra, N. J.

Bouquets for Operators?

To the Editor

A month or so ago I wrote you a two page letter regarding the buttering of CAA inspectors by letters which you insisted on printing. Next day I decided it was in poor taste and tore it up. ...

Should we by chance wish to throw bouquets, why not let the private pilot throw one here and there at the operators? Few of them deserve it, but the shining star in my 10 years of civilian flying is Phoenix Municipal, Arizona. Would that just one operator in every 200 miles would offer the facilities, courtesy, attention, and consideration that Phoenix gives to all. I will ... drop in on Cape Cod Flying service in my weary little Aeronca and see what kind of service and accommodations they have to offer.

E. S. Glines, Jr.
Stetson Instrument Service
Halsite, N. Y.

AMERICAN AIRLINES 5-Mile-a-Minute Flagship Fleet

. . . relies on SINCLAIR AIRCRAFT OIL exclusively!

American Airlines new Convair Flagship—300-miles-an-hour, 40 passenger aircraft is designed specially to give short-haul passengers a standard of service corresponding to the longer-range DC-6 Flagship service. The powerful 2,100 H.P. engines, which lift this newest Flogship at a rate of 2,000 feet a minute, are lubricated—as are all American Flogship engines—with Sinclair AIRCRAFT OIL.

American's Convairs were put through the most intensive testing—under actual operotional conditions—ever given a plane by an airline. Carrying cargo and mail, Convairs were flown over 100,000 miles on regular, coast-to-coast schedules. In tests and in scheduled service, American's Flagships have maintained a proud record of dependability—using Sinclair AIRCRAFT OIL exclusively.

SINCLAIR AIRCRAFT OIL

Symbol of Dependable Maintenance

For 14 years, without interruption, Sinclair has aided American Airlines in maintaining exacting schedules, rigid operational standards, and dependable service. American, in that time, has flown more than 350 million miles with no other engine lubricant than famous Sinclair AIRCRAFT OIL.

For safe, dependable aircraft engine lubrication with less frequent overhaul . . . it's Sinclair AIRCRAFT OIL.

SINCLAIR

SINCLAIR REFINING COMPANY
AVIATION SALES, 630 FIFTH AVENUE, NEW YORK CITY

• Never order more than six months' supply.
• On charts close to a new printing schedule, limit the order
• Watch for one month warning on charts about to become obsolete

▶ **Gross Profit Percentage**—Proposal to pay a salesman 10 percent of the gross profit derived from total business coming in from his territory was made by G. B. Van Dusen, head of Van Dusen Aircraft Supplies, Inc., Minneapolis. It would be a means of getting the most effective selling on merchandise which will bring the distributor the greatest profit.

An overall budget of 6 percent of gross sales from the salesman's territory should cover the entire cost of that salesman. Of this his expenses might well amount to 3 percent, and the remaining 3 percent could be set up as his share of the gross profit. Assuming that the distributor's gross margin is approximately 30 percent, the salesman's 10 percent of this would amount to 3 percent of the gross sales.

ADMA President R. B. Kenty of Air Associates, Inc., Dallas, presided at the Mackinac Island sessions. H. Donald Richards, secretary, reported that action is being studied on a telegraphic code for members. Roster includes 36 distributors and 53 manufacturers.

Navion Goes To College

Oklahoma Agricultural & Mechanical College, Stillwater, has taken delivery on a new tan-colored four-place Ryan Navion, for executive travel of Dr. Henry G. Bennett, president, and other college personnel.

Goodyear Race

More than 100 builders of midget planes prepare for National Air Races.

Big fixed base operators and "shade tree" mechanics are vying with professional race pilots in building or remodeling more than 100 midget racers for competition in the 1948 Goodyear Trophy Race at Cleveland Airport on the Labor Day weekend.

▶ **$25,000 Purse**—Total purse of $25,000 has again been offered by the race sponsor, Goodyear Tire & Rubber Co. and the race is again limited to planes with engines of 190 cu. in. displacement.

Steve Wittman, Oshkosh, (Wis.) Cessna distributor and oldtime racing pilot, will re-enter his midget plane "Buster".

▶ **Chester Entry**—Art Chester, Los Angeles, whose 'Swee' Pea" plane took second in the Goodyear Race last year, has sold this plane but plans to have two new racers in the 1948 competition. Tony Levier and Herman (Fish) Salmon, Lockheed test pilots, and their engineer associate, Glenn Fulkerson, of California, will enter one new plane in addition to their two Cosmic Wind planes, now being remodeled, which took third and fourth places in 1947.

Other 1947 entrants expected back in 1948 include Chester Loose, Davenport, Iowa, William F. Falck, Warwick, N. Y. and Ed Allenbaugh, North Hollywood, Calif., all expecting to enter new planes, and Gerald Francis, Lansing, Mich.; Merle Zuelke, Milwaukee; Robert Hopkins, Reidsville, N. C.; Harold Koehler, Akron, Billie Robinson, Pacoima, Calif., Ed Honroth, Northfield, Ohio, Rodney Nimmo, Hollywood, Calif., and Art Williams, Alliance, Ohio.

▶ **Builders Listed**—In addition to these plane builders, the following are reported to have Goodyear midget entries either completed or in final construction:

California—Vincent Ast, Los Angeles; Joy Deming, Palo Alto; Al Foss, Redmond; Arnold Haynes, West Los Angeles; Jim Kyle, Bellflower.
Connecticut—John R. Lezar, Durham.
Florida—Jim Addison, Miami Beach; C. H. Pitts, Gainesville; John Reaver, Panama City; Parold D. Comley, Miami.
Idaho—C. H. Henley, Coeur D'Alene.
Illinois—Ralph W. Krenger, Chicago.
Indiana—Steve Beville, Redmond; Ben E. Buenle Jr., Evansville.
Kansas—William C. Leighnor, Hutchinson.
Maryland—Beller and Associates, Baltimore.
Massachusetts—Francis Balboni, West Springfield; Robert Granville, West Springfield.
Michigan—Neal Loving, Detroit; G. P. Merlin, Detroit; Albert B. Mohn, Grand Rapids; Edward Quick, Saginaw; Martin L. Rhodes, Detroit.
Missouri—Ray W. Baker, Independence; George A. Owl, St. Louis; Lawrence Reithmaier, St. Louis.
North Carolina—Robert S. Hopkins, Reidsville; C. H. Jordan, Burlington.
Ohio—James Dickson, New Lebanon; Ray Kalani, Cleveland; Philip Myers, Akron.
Pennsylvania—Carl Beas, Reading; William Denlight, Bridal; David E. Long, Lock Haven; N. C. Van Tull, Stoneboro.
South Carolina—Luther C. Johnson, Greenwood; Skip Shellan, Greenville.
Tennessee—Richard E. Adams, Oak Ridge; A. F. Hennyworth, Nashville.
West Virginia—H. Forbes Simpson, Triadelphia.
Wisconsin—T. J. Ostrowski, Stevens Point.

NEW TEMCO SWIFT

Latest version of Texas Engineering & Manufacturing Co.'s Swift 125 features several improvements mainly to cabin comfort and convenience. Metal top canopy which shades occupants from direct sunrays hinges up and locks. New cabin windows provide improved side visibility, and a flat shelf behind seat provides space for luts, etc. Powered with a Continental 125 hp engine, the Swift is credited with 140 mph. cruising speed, 1000 ft./min. rate of climb, 48 mph. landing speed, and normal range of 425 miles, extended to 575 miles with the addition of an auxiliary tank.

AT ADMA CONVENTION: C. L. Corwin, sales manager, Champion Spark Plug Co., shows new service manual to (left to right) George Galipeau, G B Van Dusen and Frank Wright, all of Van Dusen Aircraft Supplies.

ADMA, NATA Study Air Show

Equipment and accessories display, possibly including lightplanes, would coincide with Cleveland meetings.

By Alexander McSurely

An aviation equipment and accessories show, which may also include lightplanes, is being discussed by representatives of Aviation Distributors and Manufacturers Association and National Aviation Trades Association.

The show, if held, will be scheduled at Cleveland to coincide with the three-day joint meetings of the two associations Nov 15, 16 and 17. Spokesmen for both groups have advised AVIATION WEEK that they have agreed upon those dates at Cleveland, and that final decision on the show is subject to further committee discussion. The Cleveland arrangements have superseded earlier plans to hold a combined meeting at St Louis (AVIATION WEEK, Apr 26)

▶**Bomberger Heads Show**—Under similar arrangements ADMA-NATA held aviation shows in St Louis in 1944 and 1945. Since 1946 the two associations have had independent conventions. Richard Bomberger, vice president of Sensenich Corp, and vice president of ADMA, is chairman of the show committee.

More than 90 ADMA members and guests attended the recent midyear meeting of officers, directors and committee chairmen, at Grand Hotel, Mackinac Island, Mich, to hear talks on sales and distribution problems. Private conferences also were held between individual distributors and manufacturers.

▶**Sales to Airlines**—Important savings for manufacturers and consumers alike are possible through a plan under which distributors are permitted to stock large quantities of parts and components for airlines, George W. Jalonick, vice president, Southwest Airmotive, Dallas, told the group.

Jalonick cited experiences of his own company, now representing Scintilla Magneto Division of Bendix Aviation Corp, in dealings with three major airlines. One airline official reported he expected to reduce his Scintilla inventory 66⅔ percent as a result of this arrangement, and that similar reductions in inventory could be made with other equipment. This particular airline has 250 different sources of supply, but, Jalonick says "We intend to reduce that number materially."

He stated that such an arrangement was possible only when the distributor carried a sufficiently large stock to meet the airline's large-scale requirements.

▶**Volume Viewpoint**—R. K. Moore, United Air Lines director of purchasing, said that the large stocks of parts purchased by the airlines offer "little incentive for the airlines to procure their requirements strictly from the distributor," and expressed the belief of the airline purchasing committee that the airlines' volume of purchase entitled them to the maximum discounts allowed.

He questioned the economical aspect of distributors' storing in various parts of the country sufficient quantities of materials for airline use. He said it seemed more economical from the airline viewpoint to store at the manufacturers' plant the so-called "insurance items" on which demand fluctuates. Distributors could stock the more ordinary items for which demand is constant, but could not be expected to provide a complete service to the airlines.

▶**Training Salesmen**—Fred H. Lee, jr, sales manager, and William Carolla, assistant sales manager, Hollingshead Corp, Camden, reviewed the organization's recently held sales clinic for distributors' salesmen (AVIATION WEEK, Apr 5, 1948). Fact that the aviation distributor carries competing lines makes his salesmen an order-taker rather than a salesman pushing a particular product, Lee declared. If the manufacturer expects the salesman to push his particular product, he must see that the salesman understands it and knows how to use and demonstrate it.

Best ways to achieve this end are by having the distributor pay part of the costs for the sales clinic and by carefully selecting the salesmen asked to attend.

▶**Chart Obsolescence**—Inspection of the stock of the 400 authorized dealers in aeronautical charts has suggested recommendations to dealers on how to minimize losses from obsolete charts, Comdr. B. H. Riggs of the U. S. Coast and Geodetic Survey told the ADMA group. Recommendations are:

- Make one person responsible for stock, inventory and making up an order.
- Be sure he understands contract and instructions to dealers.
- Be sure that dates of latest prints, circulars, notices, etc, are routed directly to him.

Hollowell on Board

D. H. Hollowell, vice president, Continental Motors Corp., Muskegon, Mich., has been elected a member of the board of directors of the Aviation Distributors and Manufacturers Association, succeeding R. D. Hicks, also of Continental, who resigned.

New Air Service For Sportsmen

A converted Navy PBY 5 A Catalina patrol plane is being put into service by Cook Cleland, winner of the 1947 Thompson trophy race at Cleveland, for transporting sportsmen from the Cleveland, Ohio, area into Canadian lake hunting and fishing areas.

Cleland calls his new service the Cook Cleland Catalina Airways, Inc. The big amphibious aircraft is being stripped and modified to meet all CAA specifications and to provide comfortable but not plush accommodations for 22 passengers.

▶Theory—The Catalina has a 130-mph. cruising speed at 10,000 ft. and a 2500-mi. range fully loaded. Theory of Cleland's operation is to provide a means of transportation which will get the sportsman to his northern camp in hours instead of the days necessary for any other means of transportation. Also he will be able to bring back his full take of game or fish which heretofore has been a troublesome if not impossible project with smaller aircraft used as the means of transportation. Additional safety of the twin-engined plane, and its well known war record for performance on one engine, are being emphasized by Cleland in his promotion of the new service.

In addition to Cleland, the company personnel includes Ben McKillen, first pilot, former naval aviator with extensive amphibious experience and Joe Kirwin, general manager, former naval aviator and formerly with Pan American World Airways.

▶Sliding Scale—Cost per passenger on the Catalina is on a sliding scale of 16 cents a passenger mile for 16 to 22 passengers, 20 cents a passenger mile for 11 to 15 passengers, 30 cents a passenger mile for 6 to 10 passengers, and 40 cents a passenger mile for 1 to 5 passengers.

Cleland is also planning to provide family and household moving service with the Catalina.

Air Marking in Alabama

Alabama's air marking program should be completed by Nov. 1, with 314 markers blanketing 269 towns and 45 airports, at a total cost of $18,947.

Work on the first segment started Apr. 1. The second segment was begun June 6. Standard CAA air markers, consisting of the town name in 10-ft. letters, latitude, longitude, North arrow and arrow to the nearest airport, will be used.

Contract for the second segment was awarded to Townsco Contracting Co., Oklahoma City.

BRIEFING FOR DEALERS & DISTRIBUTORS

NATA MANUAL READY—National Aviation Trades Association has completed a manual of standard accounting procedure for use of aviation school operators. It is primarily designed to provide a sound foundation of bookkeeping and accounting for the operator in preparing his cost study for the Veterans Administration.

Joe Garside, head of Wiggins Airways, Norwood, Mass., has been in charge of its preparation, working with the accounting firm of Ernst and Ernst. It was prepared after a survey of accounting practices of small and large operators, and after consultation with VA officers in Massachusetts.

Copies of the manual and accompanying forms for accounting are being made available through NATA state chapters to their members at a cost of $12 per manual. Additional sets of accounting forms will be available at a price to be fixed later. Receipts will be divided equally between NATA and the state chapters through which the manuals are distributed.

The new procedure is expected to strengthen operators on a matter where they have been most subject to fair criticism by VA—their lack of adequate books and records clearly establishing their costs.

PIPER HITS HIGH—Piper's total June shipment of 267 planes, of which 155 were PA 11 trainers, was the biggest monthly total reported by any one company in 1948. Piper total also included 29 PA-15 Vagabonds, and 62 PA-17 Vagabonds (with Continental engine and dual controls).

Luscombe shipped 68 two-placers to nose out Cessna with 61 two-placers, in their continuing competition for metal plane sales. Aeronca shipped 10 Chiefs and 23 Champions and four L-17 A liaison planes.

Reports were still awaited from Ercoupe, Taylorcraft and Texas Engineering, other two-place plane manufacturers.

CESSNA TAKES FOUR-PLACER LEAD—Cessna's new four-place Model 170 moved into the four-placer lead in June aircraft shipments, according to unofficial totals, with 102 planes shipped, in addition to 15 of the larger Cessna 190s and one 195 plane.

This gave Cessna shipment of 118 four-place planes for the month, a sizable lead over the next four-place contender, Stinson, with 90 planes, and the third place company, Beech, with 84 planes. Ryan shipped 71 four-place Navions. Aeronca shipped 40 Sedans, Piper shipped 19 four-place Model PA-14s. Luscombe reported 12 shipments of its new Silvaire Sedan, and Bellanca one Cruisair.

Total four-place shipment was 435 planes. Cessna and Beech showed the largest gains over last month shipments, when Cessna shipped 66 four-placers and Beech 58. Ryan stepped up shipments from 54 last month, but Stinson only increased its shipment by two from last month's 88, and Aeronca showed a drop from 59 four-placers shipped in May.

SLUMP IN TRAINING NOTED—CAA April report showed that only 13,886 student pilot permits had been issued in April, as compared to 17,659 in April 1947. Private pilot certificates in the same months also showed a drop to 6877 from 8450.

Continued growth in number of airports was reported, with 6143 as of June 1, compared with 5074 as of the same date last year. Virtually all the increase was in commercial and municipal fields, and nearly all of it was in Class 1 fields. Training slump shown in the student and private pilot figures is presumably a reflection of the falling off of veterans flight training expected when the majority of those eligible under the GI bill of rights, who wanted to take aviation training, had completed their courses.

DETROIT AERIAL PATROL—A Detroit police plane described as a single engine Beechcraft, presumably a Bonanza, is patrolling the skies on an unscheduled basis to pick up aerial violators who buzz the city or fly below the 1000-ft. required minimum. Plane is equipped with police and aviation radios, and can be directed to the vicinity of any reported aerial violation by ground police through radio communication.

—ALEXANDER McSURELY

FINANCIAL

TWA Finances Beginning to Clarify

Possibility seen that debentures held by Equitable Life may be exchanged for convertible preferred stock.

The recasting of the capital structure of Transcontinental and Western Air, Inc., as first indicated here (AVIATION WEEK, May 31, 1948), is beginning to take tangible form.

The initial step appeared in the proposal to stabilize the conversion rate of the $10 million in capital notes held by the Hughes Tool Co., owned by Howard Hughes.

Stockholder approval Aug. 10 is anticipated for the immediate conversion of these notes at $10 per common share for a total of 1,000,000 shares of common stock. This will remove the possibility of indefinite conversion extending to June 2, 1956, at going market prices with a floor of $5 per share for purposes of this exchange. At the lower limit, it would have been possible to obtain a maximum of 2,000,000 shares of TWA common stock in exchange for the Hughes held notes.

▶**Outstanding Stocks**—Upon the proposed conversion, TWA's outstanding capital stock will approximate 2,000,000 shares of which the Hughes interests will own about 75 percent. This condition prompted CAB to order an inquiry into the $10,000,000 loan made by Hughes to TWA early in 1947.

In view of TWA's involved finances and deficit record, many market observers were long puzzled by the persistent way the company's stock maintained relatively high market quotations. Among explanations advanced was the limited floating supply of shares due to the large block owned by Hughes. Support was also found in the belief that somehow earning power would be restored to the company and the shares represented a call on such potential profits, if and when they appeared.

More hardy speculators who were unwilling to accept such explanations translated their opinion into action by selling TWA stock "short." (This is a market process where stock which is not owned is sold in the expectation that it can be bought back at lower levels.) As of June 15, 1948, according to New York Stock Exchange records, the total short interest in TWA amounted to 8850 shares.

This action proved highly profitable. On announcement of the proposal to convert the Hughes-held notes into common stock, the market price of TWA stock broke badly from around $15.50 per share to $12. This compared to a peak of more than $22 per share earlier this year.

▶**Concurrence Expected**—In addition to stockholder approval, financial institutions holding TWA obligations also must concur in the modification of the conversion terms. Such consent is expected.

The Equitable Life Assurance Society of America is the owner of $39 million of TWA's sinking fund debentures due Dec. 1, 1955, and June 1, 1956. The principal amount of $1 million was retired on May 28, 1948, thus resulting in the reduction to the present outstanding $39 million in debentures. The National Association of Insurance Commissioners through its subcommittee on valuation of investments has directed the insurance company to carry the TWA paper at 60 cents on the dollar.

▶**Other Obligations**—In addition to the debentures, TWA has other obligations which may be affected in any recapitalization plan. In order to facilitate the financing of twelve new Constellations, TWA obtained a bank credit of approximately $18 million. As additional collateral five other Constellations acquired through a previous chattel mortgage arrangement were included in this new agreement and the former obligation funded under the broadened bank credit.

Provision has been made to amortize this bank loan over a five-year period with monthly payments starting in September of this year. In this manner, payment will be made for the equipment during the period of its useful life and should be amply covered by depreciation charges. Up to May, a total of $8 million had been drawn down on this credit. It is probable that such borrowings have since been increased. They are believed to be well over the halfway mark.

▶**Recourse to Lockheed**—This bank credit arrangement is very unusual in that recourse can be made to Lockheed Aircraft Corp., who endorsed the loan before any funds were advanced. As part of the same agreement, Curtis-Wright Corp. has accepted TWA notes in payment for the Wright engines powering the planes.

Curtiss-Wright, surfeited with cash, chose to carry this obligation itself rather than use bank credit. Lockheed, on the other hand, had bank obligations of its own and substituted, for all practical purposes, TWA paper with its endorsement reducing its own loans by a corresponding amount.

As this equipment bank credit arrangement has a self-liquidating nature, it is unlikely that it will be disturbed.

▶**Modification Likely**—It is a fair assumption that the Equitable-held debentures may undergo some form of modification. This obligation may well be the source of recurrent crises unless altered. Only the timely intervention of an emergency mail pay award by CAB enabled TWA to meet $1,100,000 in sinking fund and interest payments due May 28, 1948. Default would have made the entire issue of debentures immediately due and payable with the same condition applying to the bank debt.

Another sinking fund payment of $500,000 is due Nov. 27, 1948. Minimum payments step up to $2,000,000 for 1949 and $3,000,000 for 1950 through 1953 with increased reductions provided thereafter.

▶**Stock Increase Sought**—The increase in authorized capital stock to 4,000,000 shares, also currently being sought by TWA, would indicate that additional shares may be issued. It is possible that Equitable may exchange its present debentures for a combination of new obligations and a preferred stock, possibly convertible into common. This may be a small price to pay for the insurance company's evident lack of understanding of airline operations in saddling TWA with a huge debt without providing proper safeguards in the form of additional equity support.

New funds may also be sought to finance replacements for the DC-3s and other equipment currently operated by TWA. The addition of new aircraft would greatly facilitate the reduction on operating costs as well as enable TWA to compete more effectively with other air carriers.

▶**RFC Loan Requested**—The company applied for a $10 million RFC loan to help meet the May crisis. While CAB came to the rescue with its mail rate action, the RFC loan application is still pending.

With removal of the uncertainty surrounding the conversion of the notes held by Hughes, it soon will become possible to proceed with the other steps necessary to recast TWA's involved capital structure. This may take the pattern of placing such capitalization on a far less tenuous basis along with the introduction of additional funds.

—Selig Altschul

AIR TRANSPORT

Nonskeds Seek Atlantic Business

European travel soars, and uncertificated carriers ask CAB to relax ban on flying passengers abroad.

By Charles Adams

Indications that North Atlantic air travel will reach record proportions this summer have put energetic U. S. uncertificated carriers on the scent of some highly profitable business.

But between the uncertificated lines and the coveted traffic are strong fences erected by the Civil Aeronautics Board. And prospects are that instead of lowering the barriers to additional business, CAB will raise them.

▶**Traffic at Peak**—Demand for travel between the U. S. and Europe during the next few months will exceed the capacity of the combined facilities of American and foreign flag carriers, both surface and air, according to one uncertificated operator. On this premise, it has asked CAB to let down bars which since last September have prevented nonscheduled carriers from flying passengers to foreign points.

Leading the fight against the uncertificated operators' challenge is Pan American Airways. PAA has denied there is any existing or imminent "emergency" requiring additional carriers to fly between the U. S. and Europe and has roundly condemned attempts by uncertificated operators everywhere to skim the cream off air travel during peak seasons.

▶**Contract Carrier Controls**—Efforts by uncertificated carriers to obtain a relaxation of CAB's ban on nonscheduled transportation of persons to foreign points comes at a time when the future of contract operations is cloudy. Backed by the Air Transport Association, CAB has asked Congress for authority to place contract carriers under strict economic control in accordance with recommendations made by the President's Air Policy Commission and the Congressional Aviation Policy Board.

Even closer to the neck of the contract operators are stringent new regulations which would require them to observe safety standards similar to those covering certificated carriers. The new rules are contained in a proposed Part 45 of the Civil Air Regulations.

Effective control of contract carriers —especially those using large transport-type planes—has become a thorny problem to CAB since the war. During the past two years, the Board's tightened economic regulations limiting the scope of nonscheduled operations have driven scores of companies to the apparent refuge of "contract" activity.

▶**Scope of Operations**—CAB points out that many "alleged" contract operations are being conducted between the U. S. and foreign points. "Such operations," the Board states candidly, "are believed to have resulted from our withdrawal of authority for common carriage of passengers to foreign points (under the nonscheduled exemption)."

According to CAB estimates, at least 24 carriers are providing contract service to other countries. These companies have available about 56 large transports (including 20 DC-4s), compared to 181 such aircraft being employed by certificated U. S. carriers in scheduled overseas and foreign air transportation.

THE TIGERS CELEBRATE

One of the nation's pioneer anfreight carriers, the Flying Tiger Line, has observed its third anniversary. Activated on June 25, 1945, as National Skyway Freight Corp., the transcontinental cargo line reported record business in May, when its gross revenue reached a rate of $2,000,000 annually. President Robert W. Prescott, formerly one of the aces of Gen. Claire Chennault's Flying Tiger group, reports that deficits are being trimmed and that his company will be making money in a few months "if CAB gives us a favorable decision in the airfreight route and freight forwarder cases." Prescott (seated) is shown above with Bill Bartling, vice president-operations, who was also a Flying Tiger ace with Chennault in China.

U. S. contract carriers serving foreign points have tapped business aggregating tens of millions of dollars during the postwar period. Air Force and Army Engineer Corps contracts in the Pacific alone during the past three years have aggregated well over $10,000,000.

▶**New Business**—Movement of immigrants and refugees from Europe to Canada and South America has also proved to be a multimillion dollar proposition for contract lines. The International Refugee Organization last month started a mass air exodus of European displaced persons to Venezuela, with possible 25,000 people going to South America by plane under IRO sponsorship in the next three years (AVIATION WEEK, June 21).

The crisis in Berlin brought unexpected business to U. S. contract carriers last month. To facilitate its huge cargo movement into the blockaded German capital, the Air Force found itself with the problem of flying 62 tons of materiel (predominantly spare parts for C-54s) from Westover Field, Mass., to Frankfurt.

The Military Air Transport Service was unable to handle the movement within the time specified, and the traffic went to the commercial airlines. Seaboard & Western Airlines contracted to carry four planeloads of material to Frankfurt, Alaska Airlines and Pan American Airways two planeloads each, and American Overseas Airlines one planeload.

▶**Principal Carriers**—Besides Seaboard & Western and Alaska Airlines, other major U. S. contract operators flying to foreign points during the postwar period have been Transocean Air Lines, Pacific Overseas Airlines, the Flying Tiger Line and Trans-Caribbean Air Cargo Lines. During the past year, four of these six carriers have run into serious conflict with CAB over the scope of their activities.

Trans-Caribbean touched off the current sharp controversy over North Atlantic traffic by its assertion that presently certificated carriers can't meet peak demand for passenger business between the U. S. and Europe this summer and early fall. It declared that reservations for trans-Atlantic travel during the next few months are difficult if not impossible to obtain.

Operating five DC-4s on a contract and nonscheduled basis, Trans-Caribbean would like to have CAB lift completely its ban against nonscheduled passenger flights to foreign points. But as an alternative to a revision of CAB's overall policy, the company is seeking a

temporary exemption during the summer season.

▶ **Continued Bottleneck**—Trans Caribbean said its Atlantic operations in the summer of 1947 (before the CAB ban) helped relieve a bottleneck in westbound transportation. It added that many American citizens decided not to make trips to Europe in the summer of 1947 because of their inability to obtain return reservations.

"This situation," Trans-Caribbean continued, "is now being intensified in a period crucial to U. S. interests because of the European Recovery Program." The carrier added that only two first class U. S. surface vessels are now available to transport American tourists (with their highly important dollar exchange) to Europe.

Pan American Airways, whose vice president in charge of traffic and sales had predicted a 25 percent increase in U. S.-Europe travel this summer (AVIATION WEEK, May 31), took a different tack in answering Trans-Caribbean. PAA said optimistic allegations concerning anticipated seasonal increases in trans-Atlantic traffic have already been directly affected by (a) serious political situations in Czechoslovakia, Austria, the entire Middle East and India, amounting in some areas to actual warfare, resulting in reduced travel not only because of fear but because of inability to obtain passports, (b) the austerity program in England causing reduced tourist traffic and (c) dissipation of the immediate postwar exodus from Europe.

▶ **Different Viewpoint**—Less than a month before, after an extensive European survey trip, Willis C. Lipscomb, PAA vice president, had declared "The United Kingdom is unquestionably ready for visitors." He added that Czechoslovakia was also preparing for tourists despite that country's change in government and noted that "in terms of travel interest Austria is coming back fast."

But more importantly, PAA cited the increase in available seat capacity of certificated U. S. air carriers and foreign airlines on the trans-Atlantic run this year. Total inbound and outbound seats, which numbered 142,477 between June and October of 1947, will increase to 200,671 this year—a net gain of 194 seats a day in each direction. These figures, Pan American explained, do not include the Canada-Europe services operated by Trans-Canada Air Lines and BOAC.

▶ **Surface Capacity**—PAA also noted the increased capacity of surface ships (especially British vessels) on the U. S.-Europe run. It said that during June of this year, combined inbound and outbound ocean liner berths numbered 53,000—more than double the total available in June, 1947.

The three U. S. trans-Atlantic flag carriers suffered combined losses before mail pay of $13,938,000 in 1947 and $7,954,000 in the first quarter of 1948, Pan American emphasized. TWA was recently granted increased mail pay to relieve its critical financial condition, American Overseas has told CAB its need for more mail compensation is acute, and Pan American is also seeking an upward adjustment in rates. In view of this situation, "it is obvious that whatever amounts of increased revenue will be available during the peak season on the North Atlantic route should belong to the certificated air carriers to make up for past losses," PAA concluded.

Idlewild Dispute

Lines might be forced to terms by Authority purchase of Teterboro.

Indications that domestic air carriers may have to abandon their boycott of New York International Airport (Idlewild) loomed last week as the Port of New York Authority neared the end of negotiations to take over the question of Teterboro Air Terminal.

Fred L. Wehran, owner of Teterboro, expected that negotiations with the Port Authority would be favorably completed by the end of last week. Selling price was estimated at $5,000,000.

The domestic airlines serving New York have felt that Teterboro might be an ace in the hole in their squabble with the Port Authority over lease terms at Idlewild. Some thought if agreement on new leases could not be arranged, there was a good possibility of moving operations to the large privately owned field across the Hudson River in New Jersey.

▶ **Overcrowded**—According to Wehran, Northwest, American and Eastern were among the airlines that have been investigating the possibility of operating out of Teterboro. But Teterboro handles more than 25,000 landings and take-offs monthly and is already overcrowded.

If, however, terms cannot be made with the Port Authority, Wehran will expand the field's present facilities to accommodate passenger as well as freight traffic.

▶ **For Freight Only**—Although the Port Authority's acquisition of Teterboro virtually would force the airlines into Idlewild, actually this is not behind the Authority's interest in the Jersey field. More than eight months ago the Port Authority made inquiries about the field with an eye toward development of revenue from all freight operations in the New York vicinity.

Meanwhile, Idlewild grossed only $13.53 for its first three days of operation. But increased business is not too far away. Four more carriers, three of them foreign flag airlines, and one an all-freight carrier signed initial leases with the Port Authority for the use of New York International Airport. They are Sabena, SAS, KLM, and Seaboard and Western, an international all-freighter.

Three other lines previously to sign with the Port Authority were Linea Aeropostal Venozolana, Air France, and Peruvian International Airways, which was expected to land its first scheduled flight at International Airport last week.

Inter-airline reciprocal agreements tottered with the signing of these foreign flag carriers.

▶ **Maintenance Problem**—Sabena, which is expected to start full scale operations at Idlewild in August, has held an agreement with Pan American for more than a year covering maintenance, food and passenger handling at Brussels and Leopoldville. Pan American has been handling the maintenance and food for Sabena at La Guardia. When Sabena moves to Idlewild, however, they will be faced with the expense of providing for their own maintenance and food stocks.

The Belgian carrier is understood to be negotiating with Willis Air Service and Sailors Instrument Overhaul, two maintenance operators, who will be located at Idlewild.

Slick Gets AF Contract

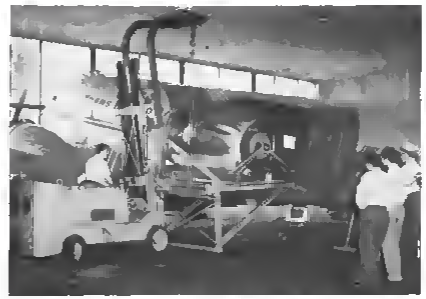
Slick Airways has been awarded a $1,150,000 Air Force contract to recondition 66 Curtiss C-46 transports to be used in the Air Force reserve program. The planes will be taken from storage at Walnut Ridge, Ark., and other depots and will be ferried to Slick's San Antonio base for overhaul.

Work is to be completed by the end of the year.

Slick's Burbank, Calif., base is completing a reconditioning job on 50 C-46s for the Chinese Air Force under a contract granted last winter.

Canada Pays Air Passage

The Canadian government will spend $1,340,000 this year to fly immigrants from Europe to Canada. Funds cover flights by Trans-Canada Air Lines and its sub-contractors.



Tow motor hoists cradled power unit to loading ramp-platform and unit is moved automatically into the loading bay of the modified C-47. Then the loading ramp is dismantled, and it, too, is stowed away inside the craft.

Modified C-47 Carries Connie Engine

TWA tries to make possible lower engine inventory by flying complete power egg to overhaul base.

Holding down inventory and still having enough emergency engine replacements on hand is a problem that has bothered airlines for some time.

TWA, speculating on the possibility of delivering power units to its Kansas City overhaul base by air, contracted with Pacific Airmotive Corp. about three months ago to modify a plane as an engine-carrier.

▶ **An Idea**—The result is a specially equipped C-47, capable of carrying a Constellation power egg which can be loaded or unloaded in half an hour.

The plane also can carry two DC-3 engine assemblies instead of the Connie engine.

PAC engineers, together with CAA officials and Douglas Aircraft Co. engineers, worked out a modification plan for enlarging the door of the C-47, reinforcing the floor and fuselage, installing a conveyor loading system and constructing the necessary cradle and loading ramp to handle the 4000-lb. Wright R-3350 engine assembly.

▶ **Changes**—A loading door was enlarged by addition of one fuselage station to the forward portion of the door. Tie-down facilities were installed in the floor beams to hold the power assembly in place.

Basis of the automatic loading system is a conveyor unit made by the Trusty Air Cargo Conveyor Co., Los Angeles. Conveyor is flush-mounted in the floor, first of this type to go into a C-47. Conveyor system is hooked onto the loaded cradle by pulley cables as soon as the cradle is on the loading ramp at the aircraft door. Loading from that point to the bolting down of the unit is completely automatic.

The system requires only a two-man crew. Power for the loading is provided by an auxiliary battery plugged in externally to the conveyor's 24-volt electrical system.

▶ **Supervisor**—Actual work by PAC's Kansas City (Fairfax Airport) branch was under the direction of Dudley H. Crim, supervisor of maintenance and overhaul for PAC. The plan for the project was worked out by Ralph Swaisgood of R. H. Swaisgood and Associates, Los Angeles.

While the job represents one of the largest modifications ever made on a C-47, cost of the project will be considerably less than the cost of a Constellation power egg.

Meanwhile, TWA now can fan out power units rapidly for emergency use from Kansas City maintenance headquarters. And Constellation engine inventories need not be stocked at outlaying stations.

O'CONNELL ROAMS

CAB Chairman Joseph J. O'Connell, Jr., last month landed unannounced at the home bases of four feeders, Wisconsin Central Airlines, Empire Air Lines, West Coast Airlines and Southwest Airways, during an eight-day field trip. He followed the same procedures as CAB Member Harold A. Jones who visited five other feeders in May. While at Seattle, O'Connell inspected Boeing Airplane Co.'s plant. He is shown (left) examining the nose wheel of a Stratocruiser with Wellwood E. Beall, Boeing vice president-engineering and sales.

Air Cargo, Inc., Sets Up Pickup, Delivery Service

Ground transportation facilities for pickup and delivery of cargo at points served by the certificated domestic airlines have been virtually completed, according to Air Cargo, Inc.

A midyear survey by the certificated airlines' ground service organization shows it has established facilities at practically all points served by more than one carrier and that the operator concerned provides service at points served by only the single carrier. Smaller cities adjacent to places directly served by certificated air carriers but included in the door-to-door pickup and delivery pattern total over 2000 additional points.

The transportation pattern set up by Air Cargo Inc., includes downtown terminals for shipper convenience in practically every city now served. In addition to regular pickup and delivery, expedited special service is available when desired by shippers. About 700 vehicles are used daily in the Air Cargo, Inc., setup.

Six Crash Probe Reports Issued

CAB labels cause of Bainbridge accident unknown; gives findings on two PAA, three nonsked crashes.

More than a year of investigation has failed to disclose the cause of the most costly commercial air accident in U S history—the crash of an Eastern Air Lines DC-4 near Bambridge, Md., on May 30, 1947.

Bound from Newark to Miami, the EAL plane had been flying straight and level at 4000 ft in clear weather when it suddenly went into a dive. The dive became progressively steep and was beyond the vertical (with the plane on its back) just before impact. No message suggesting trouble was received from the crew.

CAB said the probable cause of the accident was "a sudden loss of control for reasons unknown, resulting in a dive to the ground." All 53 occupants were killed.

▶**Six Reports Issued**—This report was one of six issued by CAB in a recent flurry of activity. The Board also announced its findings in the Pan American Airways Constellation accidents at Mayadine, Syria, and Shannon, Eire, and three fatal crashes involving DC-3s operated by uncertificated carriers.

CAB advanced ten theories regarding the cause of the Eastern crash. But after the most intensive investigations ever made by the Board, most of the theories were refuted and the others were found to be unproved or unprovable. There was no evidence of structural or power plant failure.

The report noted that government investigators probed deeply into all maintenance matters that were even remotely suspected of having been the source of failure in the DC-4 and into other maintenance matters quite removed from the probable initial failure. CAB said that as a result of this stringent inspection there has been a beneficial overall tightening of air carrier maintenance procedures.

PAA IN SYRIA

Probable cause of PAA's Syrian crash on June 18, 1947, was found to be a fire which resulted from an attempt to feather the No. 2 propeller after failure of the No. 2 engine thrust bearing.

Seven of the 26 passengers and seven of the ten-man crew were killed in the night belly landing in the desert near Mayadine.

About five hours after the takeoff from Karachi, India, for Istanbul, Turkey, the No. 18 exhaust rocker arm on the No. 1 engine broke as a result of fatigue. The No. 1 propeller was feathered, but the pilot continued toward Istanbul, descending to 10,000 ft to provide adequate cooling for the three operating engines.

▶**Second Engine Fails**—Three hours after the loss of the No. 1 engine, the thrust bearing for the No. 2 engine failed, which resulted in blocking the passage of oil from the propeller feathering motor to the propeller dome. Subsequent to failure of the No. 2 engine thrust bearing, engine oil caught fire in the upper inboard region of Zone 1 of that engine and extended through Zones 2 and 3.

Before an emergency landing could be effected, the No. 2 engine dropped from the Constellation, and the fire continued in the wing panel. In landing, the plane ground-looped violently and came to rest in flames. CAB found no evidence of faulty maintenance and made no criticism of the crew's decision to continue toward Istanbul after the failure of the No. 1 engine.

PAA AT SHANNON

The PAA Constellation accident at Shannon, Eire, Apr. 15, 1948, was probably caused "by the continuation of an instrument approach to an altitude insufficient to clear the terrain," according to CAB.

A contributing factor may have been the failure of the pilot's instrument fluorescent light.

The plane left London for Shannon despite a known defect in the fluorescent light which illuminated the pilot's instrument panel, although weather information indicated a night instrument approach would be required for landing at Shannon. There was no evidence of other mechanical difficulty in the Constellation's operation prior to impact.

▶**Aids Functioning**—The instrument landing system at Shannon and all navigational radio aids in the vicinity of Shannon airport were operating normally. The plane made a practice approach using ILS, flew over the field at about 500 ft and proceeded on its second and final approach without reporting difficulty. While executing this final approach, the Constellation struck the ground 2380 ft from the approach end of the intended runway and was immediately enveloped in flames.

"It must be concluded," CAB said, "That the plane was flown below the minimum approach altitude when no clear visual reference to the field existed." Twenty passengers and 10 crew

members were killed in the accident, and one passenger survived.

NATIONWIDE AIR TRANSPORT

Crash of a Nationwide Air Transport Service DC-3 near Carmel, N. J., Jan. 5, 1947, was probably caused by imminent fuel exhaustion which forced the pilot to attempt an emergency crash landing.

But two contributing factors were of major importance. One was the failure of the U.S. Weather Bureau to anticipate below minimum weather conditions north and south of Washington sufficiently in advance of the NATS flight arrival at each of the various terminals selected as the destination and alternates.

Another factor was the oversight by CAA personnel in failing to note the status of communications and lighting facilities at Millville, N. J., and in failing to transmit the plane's flight plan by teletype to Millville in sufficient time to alert that station for the expected arrival.

▶ **Weather Turns Bad**—The plane was bound from Miami to Newark with Raleigh, N. C., the first stop. Weather was forecast to remain above minimums during the run to Raleigh, but it deteriorated prior to arrival of the flight, and the pilot received clearance to Richmond.

Although Richmond weather was above minimums at the time of the clearance and was forecast to remain above minimums it was below minimums when the flight arrived. The pilot then requested and received clearance to Washington.

Weather at Washington remained well above instrument flight rule minimums throughout this portion of the flight. But considerable delay was being experienced at Washington as a result of traffic congestion and the existence of emergencies in that area. (Seven emergencies were declared at Washington, two at Philadelphia and two at Baltimore in a three-hour period.)

▶ **Continues to Millville**—Having overheard radio conversations concerning Washington area emergencies, the pilot requested clearance to Millville, N. J., without making inquiry on the estimated delay in approach clearance at Washington. Clearance to Millville was given by the Washington air traffic control center.

But in delivering this clearance the aircraft communicator at Washington failed to transmit information concerning the status of facilities at Millville. Due to an oversight, no irregularities in the Millville facilities were noted in the airman's guide.

▶ **Station Closes Down**—Shortly after the NATS plane left the Washington vicinity, the Washington communicator recalled that the Millville communications station ceased operation at 8 p.m. Since the flight's estimated time of arrival at Millville was about 8:05 p.m., attempts were made to inform the crew of the situation, but radio contact could not be established.

Failing to sight the unlighted Millville airport after the first approach, the pilot attempted to locate the field for about 10 minutes by maneuvering under the overcast. Although the airport lights were turned on shortly after the first approach, the plane did not return to the field's immediate vicinity. Because of his critically low fuel supply, the pilot crash landed near Carmel, N. J., with three of the occupants sustaining fatal injuries.

COSTAL AIR LINES

The accident involving a coastal Air Lines DC-3 near Savannah, Ga., on Jan. 7, 1948, was probably caused by faulty fuel management, which caused engine failure and resulted in a forced landing.

Bound from Newark to Miami, the plane came down in a marsh, with fatal injuries to the pilot and 17 of the 25 passengers aboard.

Shortly before the crash, the two engines ran roughly and then stopped, with the fuel pressure gauges at zero.

CAB tests indicated no mechanical failure and showed the fuel starvation must have come from one of two sources: either both engines were operated from only one tank, or a line rupture occurred in the fuel system. The Board decided the possibility of a broken or ruptured fuel line was extremely remote and said it was far more likely that the loss of fuel pressure was due to operating two engines from one tank until the fuel supply in the tank was exhausted.

BRUNING AVIATION

Crash of a Bruning Aviation cargo DC-3 near Columbus, Ohio, on Feb. 25, 1948, was blamed on the crew's continuation of an instrument approach below an altitude sufficient to clear the terrain en route.

The surviving copilot testified that he had objected to the pilot's descent below the 1600 ft. minimum for the instrument approach to Port Columbus airport. The pilot was killed in the mishap.

CAB said "it is apparent there was a lack of cooperation and teamwork during the instrument approach. While the captain was making the approach, the copilot was occupied in a search for a Columbus instrument approach chart instead of maintaining a lookout for the ground."

FAM Payments

Congress slashes Post Office '49 appropriation for foreign airmail.

Foreign airmail payments are slated for close scrutiny by the new Congress convening in January.

With this in mind, the recently adjourned Republican Congress allowed only $29,925,000 for foreign airmail payments by the Post Office Department during the coming fiscal year. This compares with the minimum of $33,466,000 the Department estimates it will require for fiscal 1949 and the $40,500,000 appropriated for the 1948 fiscal year for foreign airmail.

▶ **Review Planned**—When the Department requests a supplemental appropriation after the turn of the year, the House and Senate Appropriations committees plan a thorough review of mail payments to U.S. international airlines.

The $47,401,000 approved for domestic airmail payments for the coming year is the amount asked by the Post Office and compares with the $47,000,000 appropriated for the 1948 fiscal year.

▶ **Payments Listed**—Post Office Department's schedule calling for payment this fiscal coming year of $33,463,000

to airlines for foreign annual services and $3,000,000 for mail handling in the Canal Zone, is as follows:

Pan American, FAM 5—New York-Miami-Houston to Buenos Aires, via Balboa and east coast of South America, $2,431,068

Panagra, FAM 9—Balboa to Buenos Aires via west coast of South America, $1,104,386

Pan American, FAM 14-19—San Francisco-Los Angeles via Honolulu to Asia and Australia, $14,205,672

Pan American, FAM 18—New York to Europe, Africa, and Asia, $2,692,546

American Overseas, FAM 24—New York to Europe, $1,627,770.

American, FAM 26—Dallas—El Paso to Mexico, $66,102

TWA, FAM 27—New York to Europe, Africa and Asia, $2,788,493

Northwest, FAM 28—Minneapolis-Seattle via Alaska to Manila, $4,689,596.

Eastern, FAM 29—Miami to San Juan, $35,135

▶**United, FAM 30**—San Francisco to Honolulu, $311,612

▶**Chicago & Southern, FAM 31**—New Orleans-Houston via Havana to San Juan and Caracas, $1,536,194.

National, FAM 32—Miami-Tampa to Havana, $48,067

Colonial, FAM 33—New York-Washington to Bermuda $197,993

Braniff, FAM 34—Houston to Rio de Janeiro and Buenos Aires, $1,104,399.

Planned payments to foreign carriers are Peruvian International, $78,550, Sabena, $43,500, Scandinavian Airlines System $340,488 Swissair, $1,000, and KLM $160,429.

Post Office officials explained the payments to foreign lines follow its policy of dispatching international mail by the most expeditious means possible to foreign countries which adhere to the same practice and utilize U. S. carriers "Up to the present time U. S. carriers have received many times as much pay for transporting mails of foreign origin as has been paid to foreign carriers," the Post Office reported. Foreign carriers are paid the same rates then respective countries pay U. S. carriers for transporting mail

Board Is Cautious On Flight Recorders

The fiasco which resulted from premature regulations requiring installation of terrain clearance indicators on scheduled aircraft (AVIATION WEEK, May 10) will not be repeated with new model flight recorders

U.S. airlines lost between $500,000 and $1,000,000 when CAB forced utilization of the proximity devices on practically all scheduled passenger planes, only to rescind the rule after finding the instruments had not been sufficiently perfected. Now the Board's Safety Bureau has taken a more cautious approach

▶**Rule Modified**—Last September, CAB adopted Civil Air Regulation amendments requiring installation of flight recorders by June 30, 1948, on all scheduled airline planes carrying passengers or cargo. In March of this year, a modification made the requirement applicable only to planes with a certificated maximum takeoff weight of 10,000 lb. or over.

The Board's Safety Bureau now has announced that delays in producing adequate flight recorders made it impossible for the airlines to comply with the requirement by June 30. It also said that because all of the flight recorders available are of new design, some operational experience is desirable to prove the serviceability and dependability of each type before requiring that all transport aircraft be equipped with the device.

▶**Program Drafted**—The Air Transport Association, on behalf of the scheduled air carriers, has agreed to initiate a program for the service testing of available recorders on the various planes used by the airlines. This program will be submitted to CAB for approval, and the carriers will make periodic reports to the Board with respect to the service tests being conducted.

After an appropriate proving period, CAB plans to set a date when all scheduled air carrier aircraft over 10,000 lb. certificated maximum takeoff weight will be required to have flight recorders. Observers believe that had this procedure been established with the terrain clearance indicator, losses on premature introduction of the device would have been nominal

CAB SCHEDULE

July 12—Hearing on PCA-National equipment interchange agreement. (Docket 3291.)

July 12—Oral argument in safety action brought by CAA against former American Airlines pilot Charles R. Sisto (Docket SR-1987.)

July 14—Prehearing conference on new service between the U. S. and Puerto Rico (Docket 3123 et al.)

July 14—Oral argument in Chicago helicopter service case. (Docket 2344 et al.)

July 19—Oral argument in Pan American Airways' domestic route case. (Docket 1869.)

July 26—Hearing on Pan American Airways Pacific certificate amendment case postponed from July 6. (Docket 2953.)

July 26—Hearing on foreign air carrier permit application of Servicios Aereos Cruzeiro do Sul. (Docket 3236.)

July 27—Hearing on National Airlines route consolidation case. (Docket 2967.)

Sept 13—Hearing on Board's investigation of free and reduced rate transportation, postponed from Aug. 2. (Docket 2787, et al.)

SHORTLINES

▶**Air France**—Made its 900th regular North Atlantic flight on the second anniversary of its service to the U. S., June 28. Company flew 5100 passengers over the North Atlantic in 1946, 10,500 in 1947 and 7200 up to June 28 of this year. The carrier's initial schedule of two roundtrips weekly has been increased to nine.

▶**BOAC**—On July 1 began its third year of postwar trans-Atlantic service. Company flew 28,562 revenue passengers over the North Atlantic between July 1, 1946, and July 1, 1948. An additional 28,512 passengers were carried between Bermuda and New York and Baltimore.

▶**Mid-Continent**—Reports revenues and traffic volume in May were highest in company history, resulting in a $44,085 net profit against an $18,974 net profit in May, 1947. May operating revenues of $661,564 were 18 percent above April and 37 percent above May last year. Revenue passengers increased from 24,076 in May, 1947, to 31,675 in May, 1948, but the load factor declined from 64.76 percent to 63.19 percent. Company in the 35 days ended June 24 recorded 430 consecutive on-time departures out of Wold-Chamberlain Field, Minneapolis.

▶**Northeast**—Carrier's annual report to stockholders notes that the tentative $1,380,832 loss in 1947 has been cut by $140,000 through retroactive mail payments. It added that since mail pay accruals for the last eight months of 1947 are based on temporary rates, NEA cannot accurately estimate its actual deficit at this time.

▶**Northern Airlines**—The uncertificated Seattle-based carrier has been permanently enjoined by U. S. District Court from carrying passengers or cargo between Alaskan points but may still fly nonscheduled between Alaska and the U. S. Injunction was sought by Pacific Northern Airlines, with CAA, Northwest Airlines and Pan American Airways as intervenors.

▶**Northwest**—Carried 2611 passengers on Sunday, June 20, making the second highest passenger traffic day in the company's history. Peak day was Aug. 29, 1947, when 2706 passengers boarded NWA planes. Directors have declared the regular quarterly dividend of 28¢ cents a share on cumulative preferred stock, payable Aug. 1 to stockholders of record July 21.

PICTURE CREDITS

Aviation Week—14, McGraw-Hill World News—32; NACA—11 (right); USAF—11 (left); USN—16.

SEARCHLIGHT SECTION

(CLASSIFIED ADVERTISING)

Continued on page 54

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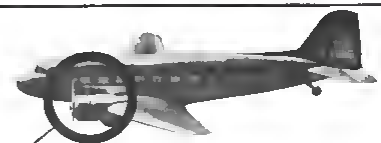

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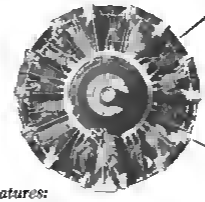

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PROFESSIONAL SERVICES
See first issue of month

SEARCHLIGHT SECTION
(Classified Advertising)

EDITORIAL

Washington Round-Up

WASHINGTON, D C

Symington Says No—Walter Winchell's column claims Air Secretary Symington's resignation is on Truman's desk, but Mr Symington tells us it is not so. "Why should I quit? Anybody can be a quitter," he said just before he was introduced at a McGraw-Hill editor's conference here

CAA Legal Change—Washington topsiders say Richard E Elwell, CAA general counsel, will be replaced soon in one of the first major changes dictated by the new CAA Administrator. Stanley Bobskill is presently slated to replace Elwell Bobskill is now general counsel of Region I Dent Dalby, now assistant to the general counsel, directing the enforcement and litigation section, is expected to be replaced by Marshall Stewart, who is a member of the CAA legal staff Bobskill has the strong support of Sen McCarran and a group of influential men on Capitol Hill, who originally backed him for the job of Administrator Bobskill formerly was a special legislative assistant in McCarran's office

Govt. Publicity Shuffle—According to the press release, New York Times man Harold Hinton becomes "Assistant to the Secretary of National Defense, Office of Public Information." Capt Robert Berry, USN, who has been assistant to the Secretary for Public Relations remains assistant to the secretary in "matters affecting the personal public relations of the secretary." Capt Berry thus becomes the assistant who deals with Mr Forrestal's newest assistant Actually, while Hinton is to develop "an over-all public information policy for the National Military Establishment" and coordinate its public information activities, Air Force public relations will not be affected to any extent in the near future A consolidated press room will replace the old Army and Air Force room and the Navy press room, but each service retains its own information divisions and chiefs.

New Law Firm—Formation of the new law firm of Gewirtz and Maclay is causing a flurry among Washington and New York aviation attorneys One of the first clients of the ex-CAB staffers is Colonial Airlines. The fact that Gewirtz and Maclay may represent several so-called nonscheduled carriers is another harbinger of a still hotter phase of the struggle between the scheduled and nonscheduled lines Incidentally, it seems likely that CAB ex-Chairman James Landis will join the firm sometime in the future.

Defense Review Holds No Terror—Aviation people are showing some concern that President Truman and Secretary Forrestal will slice aircraft procurement in the September or December review of the defense program. However, even if they did, it would be late 1951 before the cuts would reach the aircraft industry, and there is optimism here that the GOP, if it wins, will continue to be strongly air-minded to the point of increasing the plane program rather than cutting it

Regulations Overhaul—Delos Rentzel tells friends he plans to start shortly on a major overhaul of CAA policies on interpreting regulations, simplifying and weeding where possible. He favors a strong emphasis in CAA activities on research and development, rather than on police duties Rentzel has been touring the various regions

Air Force Budget—For the first time in history, the Air Force is preparing its own budget Civilian Donald Burrows and 12 civilian assistants are at work Burrows comes from Surplus Property Administration. He has been in government 12 years, including jobs with Labor Department, OPA and Maritime Commission

5-Year Procurement Bill—The Congressional bill which would have assured a five-year procurement program for the Air Force was an innocent victim of the hectic last minute rush of Congress to adjourn. There was no opposition to it It would have provided contract authority for the full five years, with appropriations to be made annually, instead of requiring both authority and appropriation each year. Now, aviation people must start over again on a promotion campaign to pass a similar bill when Congress returns

No Carriers for Air Force—Ever try to get an Air Force general aboard a Navy carrier? Navy has tried for years through the formal and informal invitation method but with no success Such carrier critics as Arnold, Spaatz, Craig, Craigie etc, have been "busy" when cruises were being arranged Vandenberg claims to have been aboard a carrier once, but Navy cannot easily confirm the date and place. Latest lasso attempt of the Navy was ducked awkwardly by Air Force brass when the National Advisory Committee for Aeronautics was invited aboard the U S S Valley Forge during the NACA meeting in the bay area of San Francisco Vandenberg and Powers, both members, were suddenly "too busy" and even their deputy Craigie is unable to attend the meeting Air Force did manage to dig up a general (Brig Gen Donald Putt) and a full colonel (Fred Dent) for the dangerous mission, scheduled for this week But Air Force brass refuses to be exposed to any dilution of its carrier thinking by a short cruise aboard one

CAB Staff Indignant—CAB personnel are seething over unsupported attacks against them appearing in the airline trade press. Allegations were made that inefficiency is widespread among staff members and that corruption may exist Board employes believe the attacks were "planted" by airline executives who felt themselves short-changed in recent airmail rate decisions

Personals—Friends are kidding Bert Goss, the popular and alert public relations boss of the AIA and a VP of Hill & Knowlton He marched in both the Taft and Dewey parades at Philadelphia Doc Hartranft, who pilots the Aircraft Owners & Pilots Association, was married July 3 in the Midwest to Miss Evelyn Melby

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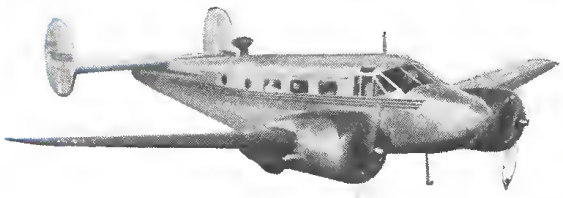

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